

BULLETIN

OF

THE NEW YORK STATE COLLEGE OF FORESTRY
AT SYRACUSE UNIVERSITY

SAMUEL N. SPRING, *Dean*

Roosevelt Wild Life Bulletin

VOLUME 6

NUMBER 4

OF THE

Roosevelt Wild Life Forest Experiment Station



Wild Life of the Archer and Anna Huntington Wild Life Forest Station
Charles E. Johnson and Wilford A. Dence

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Fig. 285. Former Headquarters of Chief Ranger Oja on west shore of Catlin Lake. June, 1933



Fig. 286. The Chief Ranger's new headquarters on Rich Lake. Photograph by E. F. McCarthy.

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PART I. PRELIMINARY RECONNAISSANCE OF
THE LAND VERTEBRATES OF THE ARCHER
AND ANNA HUNTINGTON WILD LIFE
FOREST STATION

By

CHARLES E. JOHNSON*, *Director*

*Roosevelt Wild Life Forest Experiment Station,
Syracuse, New York*

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*Deceased June 6, 1936.

INTRODUCTION*

By deed of trust dated July 30, 1932, Syracuse University, Syracuse, New York, received from Archer M. and Anna H. Huntington a tract of land of approximately 13,000 acres, situated near the village of Newcomb, central Adirondacks.

By the provisions of the deed this tract is to be known as "The Archer and Anna Huntington Wild Life Forest Station," and is for the use of the New York State College of Forestry, "for investigation, experiment and research in relation to the habits, life histories, methods of propagation and management of fish, birds, game, food and fur-bearing animals [mammals] and as a forest of wild life." The covenant of the deed further provides there shall be no shooting of birds or other animals or catching or killing of fish permitted except for such purpose as may be deemed necessary or desirable for the furtherance of the object of the conveyance to afford a protection, refuge and sanctuary for wild animal life.

The deed states further that inasmuch as the purposes indicated are in an experimental stage in this country, they may be modified by joint action of the State College or University and the donors during their lifetime, and afterward by the College and University acting alone but in full confidence that such alterations are to be made only in the direction of conserving animal life and in aid of the development of forestry.

The first step in the management of the property in 1932 was to place it in charge of a forester whose duty was to protect the tract from fire and trespass and with one assistant to perform such work as was required by the College. In the summers of 1933, 1934 and 1935 studies of the forest conditions and an inventory of the forest were made by students under the direction of college instructors. Further details of organization of the property and work of development are reserved for another publication.

As one of the first steps toward an appraisal of the tract from a biological point of view, a reconnaissance with special reference to vertebrate life and the principal features of terrain, waters, vegetation and habitat conditions in general, was begun in the summer of 1933, the results of which are set forth in the present bulletin. The part dealing with the fishes and the waters, by W. A. Dence, Assistant Director of the Roosevelt Wild Life Forest Experiment Station, appears under a separate heading. The present article is concerned

*Revised from original by dean S. N. Spring.

with the land vertebrates, namely, amphibians, reptiles, birds and mammals, and with a general description of the forest cover and the physical features of the tract.

General observation of the northern parts of the tract was made in the fall of 1932 (Sept. 29 to Oct. 1), when only about one whole day was available. The next visit, June 2 to 8, 1933, allowed about five full days of field work, and these were spent principally in the vicinity of Rich Lake, in the southeastern part of the area, with trips up Little Sucker and Big Sucker brooks, and to Wolf Pond by way of the old Cold River road. The following season, several days—June 4 to 10—were spent at Wolf Lake and vicinity. The main part of this preliminary survey, however, was carried out during two longer sojourns on the tract: from August 4 to 30, 1933, and from August 8 to September 6, 1934.

GENERAL DESCRIPTION

Location. The area included within the Archer and Anna Huntington Wild Life Forest Station is approximately seven miles in greatest length and three miles wide, lying in a northwest-southeast direction (See Map 11). Its extreme southeastern corner practically touches village limits of Newcomb. The main portion of the tract lies in Essex County, and the remainder, or northwest corner portion, lies in Hamilton County. Historically the tract is a part of the old Totten and Crossfield Purchase.

Topography. In general the Huntington Wild Life Forest Station (which, for convenience will hereafter be referred to merely as the Huntington tract, or Forest, or simply as the tract), may be characterized as typical Adirondack highland of medium elevation, the deeper depressions occupied by lakes or streams. In the central part of the tract and extending in a north-south direction is a massif containing three mountains, named in order—in the direction indicated—Catlin, Observation and Clearing mountains, ranging in height from 2400 ft. down to 2200 ft. Between this massif and the southwest boundary lie Panther Mountain and Arbutus Hill. In the southeastern part of the tract is a lower series consisting of Rock Mountain, Mt. Frio and Morass Hill, besides a spur from Baldwin Mountain (which itself lies outside the tract) with heights ranging from 2200 ft. down to 1900 ft. The southernmost corner is occupied by Goodenow Mountain with an altitude of 2700 ft.—the highest mountain on the tract. On this mountain is situated a State fire lookout tower.

The mountains just mentioned are the principal ones. A few lower hills that exist are apparently not recognized by local names and are not named on the United States Geological Survey sheets.

Drainage. The drainage within the Huntington tract proper is directly or indirectly into Rich Lake, and is affected, in the southeastern section mainly by Big Sucker, Little Sucker and Lodo brooks; in the northern and major section, indirectly by Wolf, Deer and Corner ponds, into Catlin Lake and thence through Long and Lilypad ponds and Fishing Brook. Lilypad Pond and Fishing Brook are wholly outside the tract proper. From Rich Lake the drainage is eastward through Lake Belden, in the southeast corner of the tract, and thence, beyond its limits, through Lake Harris and into the Hudson.

The Forest. Excepting the former farm land adjoining the Long Lake — Newcomb highway that traverses the southernmost corner of the tract, the land surface is covered principally with a typical Adirondack hardwood forest, including an admixture of varying amounts of softwoods.

The hardwoods are chiefly maple, beech and yellow birch; but more or less aspen is found in an old burn along the northwest boundary, near Catlin Lake and at Deer Pond, and a considerable amount of white birch also occurs in places, as, for example, along the east shore of Catlin Lake. A scattering of black ash and of large-toothed aspen was noted, especially along the principal brooks.

The softwoods are principally hemlock, spruce (both black and red), balsam fir, arbor vitae and some white pine. A small amount of tamarack occurs at Deer Pond (Fig. 296).

The beech-maple-birch forest covering the higher land is a magnificent one, which doubtless received an important impetus to growth following the first extensive removal of the softwoods, many years ago. The mature forest now consists of stately trees ranging in diameter from one to two feet, with an occasional giant yellow birch approaching three feet in diameter.

Throughout the forest generally, there is an abundant growth of witch-hobble and other shrubbery, herbaceous vegetation and varying amounts of young growth of both hardwoods and softwoods.

A word should be said regarding the many large trees occurring on the tract. These grand old trees not only have a peculiar interest in themselves as the oldest living things on the tract, but they have an important relation to its animal life. Hollows in their great trunks or limbs furnish retreats and denning places not only for flying squir-

rels and other smaller denizens of these haunts but more especially for such larger forms as the raccoon, for example, which may not always find adequate accommodations in the smaller trees. Also, any fishers that might be found on the tract would doubtless find these big trees an important factor in their struggle for existence. And the value of such old trees to animal life in a forest remains whether they stand or fall.

Lakes. These show considerable similarity in their narrow beach zones — at ordinary stages of water — and in the general paucity of aquatic vegetation. The beach zone is in many places stone- or boulder-strewn, with occasional stretches of sand and gravel. During the prolonged dry period in the summers of 1933 and 1934, however, the water level suffered an exceptional fall, and in consequence, as the season advanced, beaches and bars and mud flats became exposed to an extraordinary degree for lakes in this region (see Figs. 295 and 296). On the Huntington tract this was true especially at Catlin Lake, where the deltas of three of the four main entering streams became exposed as sandbars, and relatively broad beaches developed at various other places on the lake shore. At Deer Pond, in the shallow bay near the outlet, a number of little mud flats were exposed. Although these mud flats, sandbars and beaches were of no great extent, when the autumnal migrations set in, they doubtless were responsible for the appearance of a few shore birds that otherwise would probably not have been seen at these lakes.

The general scarcity of aquatic vegetation has been mentioned, but it should be stated that in some of the shallow bays considerable patches of water lilies and other aquatic plants occur. By the middle of August, on the exposed flats, a sparse shore vegetation had sprung up which, despite its scantiness, evidently had a decided attraction for the deer.

Brooks. The larger brooks on the tract are, like the lakes, very similar in character. In the southeastern part the principal ones are Big Sucker and Little Sucker brooks, which have their sources almost wholly within the boundaries of the Huntington Forest and flow southward as tributaries to Rich Lake. A smaller and less important tributary, Lodo Brook, enters Rich Lake from the southeast. In the northern part of the tract the principal streams are Wolf, Little Deer, Panther, Corner Pond and Round Pond brooks. Round Pond brook is the outlet of Round Pond which lies a mile or more to the north of Catlin Lake, and only a short segment of the brook comes within the boundaries of the Huntington Forest.

In early June, and after the rains in late August, 1933, these brooks presented water levels that apparently were normal for seasons of average rainfall. They were then typical Adirondack brooks with alternating pools and stretches of rapid water tumbling over gravelly, stony or boulder-strewn beds. But at the height of the dry spell (beginning of August) all of the brooks mentioned had ceased to flow throughout much of their length, although they still contained a greater or lesser number of pools maintained through springs and seepage. Some of the brooks contained no surface water in stretches of considerable length, although subsurface water would frequently be exposed when larger stones were lifted from their beds.

In addition to the larger brooks just mentioned, there are many smaller tributaries or rills that have their degree of importance. Some of these, which were spring-fed, maintained a continuous although much diminished flow through the dry period; others, of temporary character only, flowed for longer or shorter periods following rains. The beds of the latter type, at the height of the drought, were for the most part completely dry, except for an occasional seepage spot.

The importance to brook life of the so-called spring feeders that occur here and there, in periods of drought such as those of the two seasons here mentioned, becomes strikingly evident. Even though individually they may seem insignificant, their aggregate effect is often sufficient to insure the survival of many small fishes and other aquatic or amphibious creatures that without them doubtless would have perished. Small trout, for example,—but no larger individuals—were found living in many of the remaining pools on the larger brooks. Whether any larger individuals that might have been present in the brooks earlier, had retreated to the lakes before their passage was cut off, or whether they had perished in one way or another, is largely conjectural, although it was ascertained that some large brook trout, at least, did exist in one of the lakes from which the principal tributary brooks had been completely cut off as a result of the drought. In one brook I came upon a three-inch trout that had been trapped in a shallow little pool which was rapidly drying up. The film of water was not deep enough to cover the fish, which was intermittently floundering and flopping about in vain efforts to escape. The next day the water in the pool had vanished completely, furnishing a good illustration of what undoubtedly happens repeatedly to many brook trout in these streams in seasons of light rainfall. The little spring feeders along such streams, by maintaining permanent pools here and there, enable a few little fish, at least, to survive, and these

survivors may have an important part to play in any natural restocking of the brook that is to take place after the return of normal conditions of water.

Trails. In terrain such as that of the usual Adirondack variety the desirability of trails is well understood by anyone who has tramped the woods of this region. But few have, probably, a keener realization of their usefulness than has the naturalist who is out to observe and study wild animal life. A trail, even though a poor one, not only offers a measure of convenience where "cross-country" progress on foot is everywhere else wearisome and slow, but fully as important as ease in walking is the advantage of being able to proceed with as little noise and commotion as possible and thereby increase one's chances of getting a glimpse, if nothing more, of some of the more timid and retiring inhabitants of the forest environment.

A number of trails of long standing are fortunately found on the Huntington tract, connecting various water courses or other points. The more important of these trails are in satisfactory condition, partly because of recent use and repair and partly because, in a mature forest such as that here found, the obliteration of a well-worn trail by overgrowth of ground vegetation is a slow process; others have, through long disuse, become practically lost in parts of their course; although they are still traceable by the old blaze scars on the trees, and they can, therefore, if their restoration should be found desirable, be laid out along their approximate original courses.

Old Roads. Aside from various segments of more recent logging and camp roads encountered in various parts of the tract, mention should be made of two older wagon roads that once traversed this tract, and the remains of which are still in evidence. One of these is known locally as the old Cold River road (Fig. 298) and extends from the dam at the outlet of Rich Lake, just westward and then northward, passing on the east side of Wolf Pond and leaving the boundaries of the Huntington tract a short distance beyond the north end of this pond. Except for parts of it, which in more recent years have been used in logging operations, it has long been unused. It is, however, in passable condition for the pedestrian and thus offers to the naturalist an excellent avenue along which to observe wild life in the interior of the Forest through which it extends for a total distance of about five miles.

The other road is of an earlier date, and locally known as "the old military road" (Fig. 297). The course of this road within the

boundaries of the Huntington tract is indicated on the accompanying map. While this old road has long been known as "the old military road", Donaldson ('21) has shown that it was not built by the soldiers of 1812, as popularly supposed, and that it had no military purposes. According to Donaldson, the road in question is merely one of three old Adirondack roads that locally and on certain early maps have been called "military roads". The road traversing the Huntington tract is the central one of these three. It was the first to be started and was actually (*loc. cit.*) a State road, "authorized by legislative act of 1807." The road was begun in 1808 and "evidently completed, or nearly so, in 1812." The "exact course of this road" Donaldson gives as follows (*loc. cit.*, pp. 123-124, vol. II): "Starting at Chester [in the northern part of Warren County] it ran northwesterly into and through Essex County, following approximately the North Branch of the Hudson River. It then turned to the west, passing through the extreme northeastern corner of Hamilton County and crossing there the outlet of Long Lake. Thence it passed into the extreme southwestern corner of Franklin County, and so into St. Lawrence County, skirting the southern end of Big Tupper Lake. After that it followed the general direction of the Grasse River to Russell."

The segment of this old road that lies within the Huntington Forest is in relatively good state of preservation throughout much of its course. It has, doubtless, in more recent years been used as a logging road, in parts of its course at least, but no more definite information about this old road is at present available. However, like the Cold River road it now offers another convenient avenue through interior parts.

"Clearings". Occasion will arise later to refer to certain landmarks locally known as clearings, and therefore a brief explanation is here in order. These so-called clearings are now such in name only. They represent sites of former habitations dating back to the earliest settlements in the region, but which now are recognizable mainly by the character of the tree growth found on them, or by evidence of former works of man. The so-called Ackerman Clearing is on the "old military road", at the base of Panther Mountain. A space perhaps ten rods long by five in width, covered largely with grass, raspberry bushes and goldenrod is all that is left of any clearing. Catlin Clearing is on the same old road, at a point where it meets the Wolf Pond trail,—and still less of a "clearing" remains here.



Fig. 287. Catlin Lake. View from headquarters looking north. Aug. 6, 1933.



Fig. 288. Long Pond and adjacent forest as seen from top of Panther Mountain. Aug. 11, 1933.



Fig. 289. Eastern slope of Catlin Mountain with portion of Wolf Pond in foreground. Dead cedars, such as are shown in the left foreground, occur in many places about the shore line. June, 1934.



Fig. 290. Wolf Pond as seen from the southern end. June, 1934.

"The Fallow" (Fig. 293) is a practically treeless knoll on the west side of Catlin Lake, on the old Pickwacket trail running southwestward from the former site of the Caughnawauga club-house on the west shore of Catlin Lake. The thin soil on this knoll sustains only a few small conifers, patches of ferns, raspberry shrubbery, and other more or less scanty vegetation.

AMPHIBIANS

The Huntington Forest—in common with the region in general—contains a rather small assortment of amphibian species, but the great majority of these are well represented. The severe drought of the two seasons during which the present reconnaissance was made very probably had affected the amphibian life in some degree, especially the brook-inhabiting forms.

The following species were noted.

1. **Northern Bullfrog** (*Rana catesbeiana*). The most suitable localities for the bullfrog were found at the eastern end of Rich Lake—in Sonia Bay, Pickerel Channel, and at the mouths of Big Sucker and Little Sucker brooks. Many were seen in these localities during June 2–8, 1933. But the species was found fairly common also in other localities. At Catlin Lake, for example, many young bullfrogs were seen in the latter part of the summer, in the shallow bays along the west shore; and large individuals were occasionally seen in the deeper bays of this lake.

2. **Green Frog** (*Rana clamitans*). Common in localities along the lakes and the larger brooks. In June, 1933, it was plentiful in the marshy patches at the east end of Rich Lake. On the tract as a whole it is probably the commonest frog.

3. **Pickerel Frog** (*Rana palustris*). Common in some localities visited. Aside from the marshy borders at the eastern end of Rich Lake, where it was found together with the bullfrog and the green frog, many were noted, in June, at points along Little Sucker Brook where seepage had produced little patches which were marsh-like in character.

4. **Wood Frog** (*Rana sylvatica*). Probably common throughout most of the tract. Although no search was made for this frog, a number of individuals were met with in various localities—in the

vicinity of headquarters at Catlin Lake, on the east shore of Wolf Pond, and at Rich Lake.

5. **Leopard frog** (*Rana pipiens*). This species is recorded on authority of O. W. Oja, Chief Ranger on the Forest, who reported that he found one specimen near Rich Lake last spring (1936) and another in August. Undoubtedly the species is very scarce on the tract.

6. **American Toad** (*Bufo americanus*). Common generally on the tract. Large individuals were met with only occasionally, but smaller ones were numerous in various localities.

7. **Spring Peeper** (*Hyla crucifer*). In the 1933 season the spring peeper was abundant, and during August, in the northern part of the tract, its call-note could be heard at practically any hour of the day. Frequently a chorus of such notes would issue from an alder bed or other thicket in the vicinity of the water courses. But during August of the following year, in striking contrast, there was almost complete silence on the part of this hyla. Only on a very few occasions did I hear its note at all—coming from an individual here and there, more or less widely separated. It is possible that a second season of drought, following upon the first, may have depleted the local hyla population.

8. **Newt** (*Triturus viridescens*). The red or land form of this newt was generally common. The adult or aquatic form was noted in considerable numbers, in June, in the shallow bays of Rich Lake, and at Wolf Pond.

9. **Dusky Salamander** (*Desmognathus fuscus fuscus*). Common in places along the larger brooks, as for example, Deer Brook and Corner Pond Brook. At one point along the course of the latter I found about a score of these salamanders in as many minutes. An occasional specimen was found also about tiny pools or seepage spots that still remained on some of the dried-up streamlets. This species was fairly common under decaying logs in moister places in the forest.

10. **Mountain Salamander** (*Desmognathus fuscus ochrophaeus*). This salamander occurs in small numbers on the tract. It was not distinguished from the dusky salamander in the field. However, both forms were collected in the same type of habitat. Only five specimens were found.

11. **Red-backed Salamander** (*Plethodon cinereus*). This salamander also was common under decaying logs in moister localities on the west side of Catlin Lake; and it may confidently be looked for in proper situations over the tract generally.

12. **Purple Salamander** (*Gyrinophilus porphyriticus*). Less common than the dusky salamander in the localities examined. Three specimens were taken along Corner Pond Brook, several along the lower course of Panther Brook and several in the middle course of Deer Brook.

13. **Two-lined Salamander** (*Eurycea bislineata*). The two-lined salamander is probably more common than the rather hasty collecting of the present survey indicated. Only four specimens were secured: one on Panther Brook, one on a brooklet on the west shore of Catlin Lake, and two on Corner Pond Brook.

REPTILES

Paucity of reptilian species is characteristic of the region as a whole. The two forms listed are the only representatives noted on the Huntington Forest.

1. **Garter Snake** (*Thamnophis sirtalis sirtalis*). Probably common in the clearings in the southeastern portion of the tract, and possibly fairly common also in certain localities in the northwestern or greater portion. On our June visit to the tract in 1933 Assistant Director Dence reported seeing two garter snakes at the point where the Goodenow Mountain trail leaves the highway. On August 9 of the same season I saw a large individual, evidently a pregnant female, in a grassy spot along the Deer Pond trail. On our visit to Wolf Pond in June, 1934, three garter snakes were seen, one of which was found in the hardwood forest on the east side of the pond, at an elevation of about 1900 feet. In August of that season, three individuals of this species were seen at different points on the west shore of Catlin Lake.

2. **Red-bellied Snake** (*Storeria occipitomaculata*). On August 19, 1934, on a grass-covered knoll outside the ranger's garden fence, on the east shore of Catlin Lake, I obtained a glimpse of a small brown snake that slid into a hole. I believe this was the red-bellied form, but repeated visits to the place revealed no further trace of it.

BIRDS

General. Due to the general uniformity of habitat conditions over the tract as a whole, no great variety of bird life is to be expected. Within the boundaries of the Forest proper there are, for example, no large areas of swamp, bogs or marsh and, in ordinary seasons, few exposed beaches along the lake shores. Clearings are limited largely to the vicinity of the highway that crosses the south-eastern portion of the tract, and represent the sites of former farmsteads, fields and pastures. The lakes are of considerable depth and for the most part present sand, gravel and cobble beach zones with scant vegetation, and therefore offer little attraction to waterfowl, although a few "ducks" of undetermined species are reported as occurring on these lakes in the fall. A paucity of marsh-, shore- and water-birds is to be expected even during the migrations.

The annotated list of birds that follows is not to be considered as complete even for the summer season. It represents merely those species which were recorded on or in the immediate vicinity of the Huntington Forest in the course of the present reconnaissance, limited, as previously stated, to the month of August and to short periods in early June, September and October. The list may therefore confidently be expected to receive additions for the summer months, as observations continue, as well as for other seasons during which no observations of systematic nature have been carried on.

1. **Common Loon** (*Gavia immer immer*). Summer resident. The loon was seen or heard almost daily on Catlin Lake, and at times on Deer and Wolf ponds. The largest number seen together at any one time was six, on Catlin Lake, August 21, 1933. On June 8, 1934, a loon was found on a nest with one egg (Fig. 292), on the little island off the northeast shore of Wolf Pond.

2. **Pied-billed Grebe** (*Podilymbus podiceps podiceps*). Summer resident of the region. The only record obtained of this species on the tract was for August 13, 1933, when a solitary individual was seen in a little bay near headquarters on the west shore of Catlin. Because of the general lack of marshy ponds and streams on the tract, the grebe is not likely to be found in any numbers.

3. **Great Blue Heron** (*Ardea herodias herodias*). Summer resident of the region. On my first visit to the tract a great blue heron was seen at Catlin Lake, September 29, 1932. During August, 1933,

one of these birds was noted at Deer Pond, and one at Wolf Pond on the following day. During August, 1934, a great blue heron was seen on three different occasions at Catlin Lake and once at Deer Pond. At Catlin Lake during this month, once after nightfall and again in the early morning, it visited the beach at the boat landing which is within about a hundred and fifty feet of the cottage. It is possible that the records of the latter two seasons in each case pertain to the same individual that flew from one lake to another.

4. **American Bittern** (*Botaurus lentiginosus*). Summer resident of the region. The bittern was seen on only two occasions: August 8, 1933, in the marshy area bordering Round Pond stream at the head of Catlin Lake; and on the 10th, at the outlet of Wolf Pond. Owing to the scarcity and small size of marsh areas the bittern may be expected to be found only occasionally within the boundaries of the tract, and then chiefly during the migrations.

5. **Common Black Duck** (*Anas rubripes tristis*). Summer resident. A few black ducks may be expected to nest within the boundaries of the Huntington Forest each season. Typical habitats are few. On September 29, 1932, three black ducks were seen on Catlin Lake. August 9, 1933, a female with a brood of the season was found at the beaver pond on the Deer Pond inlet stream, and on the same date two individuals of the species were seen at Little Deer Pond. August 22, 1934, a flock of six black ducks was seen at Catlin Lake. The beaver pond above mentioned is the most likely locality in which to find the black duck, on the tract, so long as present conditions there are maintained. The species may be looked for also in the alder bed bordering Round Pond stream at the head of Catlin Lake.

6. **Hooded Merganser** (*Lophodytes cucullatus*). Summer resident of the region. As in the case of the black duck, it is probable that a few pairs may occasionally nest within the boundaries of the tract each season. June 5, 1933, a female hooded merganser was seen at Rich Lake, in the bay opposite the mouth of Big Sucker Brook. June 8th, and again on the 9th (1934) a female was seen flying over Wolf Pond. August 11th, following, two individuals, apparently immatures, were observed resting in a bed of spatterdock at the head of Catlin Lake; and on the 22nd and on the 23rd what was apparently an adult female was seen in a little bay north of headquarters.

7. **American Merganser** (*Mergus merganser americanus*). Summer resident. During August, 1933 and 1934, two or three separate broods of this species were to be seen almost daily on Catlin Lake. On the 28th of that month, 1933, fourteen individuals were counted in one flock, which may possibly have represented the combined broods on this lake. During August, 1934, family groups of four, five and six individuals were seen at different times on the same lake. At Wolf Pond a female American merganser was seen on June 9, 1934.

8. **Sharp-shinned Hawk** (*Accipiter velox velox*). Summer resident in the region. On August 12, 1933, while I was quietly watching for birds along the trail north of headquarters, one of these hawks suddenly darted past me and lit in a small tree a few yards away. It remained on its perch for perhaps half a minute. Again, on August 31st of the following year, in the same general locality, on a foggy morning while I was tending some traps along a little brook here found, a sharp-shinned hawk came directly toward me and lit in a sapling about twenty feet distant. It uttered a few low piping notes and then flew away.

Only two other records of the species were secured on the tract, but it may be considered to be of regular occurrence and occasionally may be found nesting.

9. **Cooper's Hawk** (*Accipiter cooperi*). Summer resident in the region. Like the sharp-shinned, the Cooper's hawk will doubtless be found to be of more or less regular occurrence within the boundaries of the tract; but only two individuals were observed in the course of the present survey: one on August 12, 1934, at Deer Pond; and one on September 2nd, at Catlin Lake.

10. **Eastern Red-tailed Hawk** (*Buteo borealis borealis*). Summer resident in the region. On my visits to the tract in 1933, the red-tailed hawk was seen in the following localities: Rich Lake, June 3rd; Deer Pond, August 14th; Catlin Lake, August 18th and 25th; Corner Pond, August 23rd.

During August of the following year the species was seen only once, on September 3rd, at Catlin Lake.

Occasional pairs will doubtless be found nesting on the tract.

11. **Northern Red-shouldered Hawk** (*Buteo lineatus lineatus*). Summer resident. During August, 1933, two or three members of a brood of this species remained in the woods near the mouth of Deer

Pond brook, in the east bay of Catlin Lake. Their noisy "*kee-yu, kee-yu, kee-yu*" was to be heard daily. August 10th, two immature individuals, probably members of the same brood, were seen perched in dead trees in an old beaver meadow on Wolf Pond brook.

June 6 and 7, 1934, the red-shouldered hawk was found at Wolf Pond.

12. Broad-winged Hawk (*Buteo platypterus platypterus*). Summer resident in the region. Although this hawk is generally common in the Adirondacks, it was seen within the boundaries of the Huntington Forest on three occasions only: June 8, 1933, along the highway in the Rich Lake vicinity; August 8, 1934, at Deer Pond; and August 9th, at one of the old club-house sites on the west shore of Catlin Lake.

13. Southern Bald Eagle (*Haliaeetus leucocephalus leucocephalus*). Summer resident. The Chief Ranger, Mr. O. W. Oja, had reported that earlier in the summer of 1933 a bald eagle had been seen at various times at Catlin Lake. On August 10th, a few days after my arrival, the report was confirmed by the appearance of an adult bird, which remained about the lake and was seen almost daily until the 23rd of the month. Meanwhile, on the 16th, it was joined by an immature individual. On the 20th an immature bald eagle was seen at Corner Pond, which possibly was the same individual.

In 1934, an immature bald eagle again was seen at Catlin Lake, on August 9th and 10th, but on the 18th an adult appeared.

In the 1933 season the adult individual on one occasion was seen perched in a dead tree at the head of Catlin Lake, but it spent most of the time in the vicinity of the east bay, where its favorite perch was a tall pine near the shore. It was also seen a few times feeding on the carcass of a large lake trout that had washed up on a sand bar across the lake from headquarters.

14. Marsh Hawk (*Circus hudsonius*). Summer resident in the region. On August 9, 1933, one of these hawks was seen in the marshy bay at the outlet of Deer Pond. During my stay of the following season the species was not seen at all. This is not surprising since the tract contains no large areas of the type that usually attracts the species. It is possible, however, that during migrations the marsh hawk may be seen more frequently in such localities as the marsh at the head of Catlin Lake, and in the old clearings in the

southeastern section of the tract, and perhaps also in the vicinity of the beaver ponds on Little Deer Pond brook.

15. **Osprey** (*Pandion haliaetus carolinensis*). Summer resident in the region. On June 5th and again on the 6th, 1933, an osprey was seen at the east end of Rich Lake, and it was undoubtedly the same individual, or a member of the same pair. On the latter date the bird had a fish in its talons and after describing a few evolutions high in the air, and uttering its characteristic "whistle", flew off in a northeasterly direction.

Eaton ('14, Vol. 2, pp. 106-107) remarks: "In the interior counties of New York the Osprey is no longer a summer resident, except in portions of the Adirondacks, where it continues to breed but yearly becomes rarer and rarer on account of the relentless persecution of thoughtless tourists and campers. Along the Hudson, the Great Lakes, and the Central Chain its history as a breeding species has been the same as that of the Bald eagle. One by one the Fish hawk trees have disappeared until now the author knows of no breeding station in the State except as mentioned above."

In the twenty years since the above quoted lines were written it would seem that the osprey has recovered but little of its lost ground. At least so far as my own observations in the Adirondacks have extended, the bird can hardly be classed as anything but uncommon at best. Perhaps the increasing monopoly of the water courses by summer tourists and vacationists may now be responsible for this situation, rather than any active persecution of the osprey on their part. However, it is to be hoped that this magnificent bird, in some respects the most interesting of our birds of prey, will continue to find sufficient sanctuary in the remoter districts of the Adirondacks to preserve it indefinitely as a nesting species of the region. The Huntington Forest offers one sanctuary where any pair that may venture to nest will be accorded freedom from human molestation, at least.

16. **Canada Ruffed Grouse** (*Bonasa umbellus togata*). Permanent resident. During my week's stay on the tract in June, 1933, only two ruffed grouse were seen, one of which was flushed from a nest containing nine eggs. In August of that year a total of fifteen ruffed grouse was seen, including one brood of four young. June 4-10, 1934, in the Wolf Pond district, no grouse were seen and no drumming was heard. From August 8th to September 7th a total

of ten grouse was seen, including three adults and one brood of seven immature birds.

From the observations of these two seasons it cannot be said that the ruffed grouse is a common bird on much of the tract. However, the brood of seven young, mentioned above, points at least to an occasional successful rearing of a fair-sized hatch, and that alone may be an encouraging sign in a period when the situation regarding this game bird has been the cause of some concern.

17. **Virginia Rail** (*Rallus limicola limicola*). On August 31, 1934, at the outlet of Deer Pond, while I was crossing a narrow strip of grassy marsh, a Virginia rail flew up almost at my feet and dropped into the grass again a few yards beyond. Its dark hue indicated an immature bird, and probably a transient, since it appears doubtful (Eaton, '10; Part 1; p. 274) that the species breeds in the Adirondacks.

18. **Semipalmated Plover** (*Charadrius semipalmatus*). Transient in the region. On August 25, 1933, two semipalmated plovers were seen at Catlin Lake, on the sand beach (delta) at the mouth of Corner Pond Brook. During August of the following year repeated visits were made to a number of sand flats that had been exposed by the continued falling of the water level of the lake that summer, but no representative of this species was again seen.

19. **Spotted Sandpiper** (*Actitis macularia*). Summer resident. While the spotted sandpiper is a common bird in the Adirondacks generally, it was found rather sparingly on the tract here concerned. This is doubtless due to the fact that (during average seasons) the exposed beaches along the lake shores are relatively few. The species was recorded four times at Catlin Lake and five times at Wolf Pond.

20. **Eastern Solitary Sandpiper** (*Tringa solitaria solitaria*). Transient in the region. A solitary sandpiper was seen August 9, 1933, on a mud flat at the outlet of Deer Pond. One was seen here again on the 14th, and one at Catlin Lake on the 20th and also on the 21st. During the following season this sandpiper was seen only once, on August 20th, at Catlin Lake.

21. **Least Sandpiper** (*Pisobia minutilla*). Transient in the region. Two least sandpipers were in company with the two semipalmated plovers above mentioned, on August 25, 1933. The species was not seen the following season.

22. **Herring Gull** (*Larus argentatus smithsonianus*). Summer resident. On my first visit to the tract, September 29, 1932, a solitary herring gull was seen at Catlin Lake. Two were seen at this lake, on August 4th of the following year; and during the same month in 1934, two were seen on the 9th and on the 11th; one on the 19th, 22nd, 23rd and 6th of September. These were all merely visitors, and there was no evidence that the herring gull nested at this lake.

At Wolf Pond, June 4-9, 1934, a pair of herring gulls was found nesting on a large boulder near the west shore (Fig. 291). The nest contained two eggs when it was first found (June 7th). During the several days of our stay at this pond the nesting pair received visits from others of their kind—on two occasions a lone individual, and on another a company of four that arrived together. When the four visitors arrived they lit on the nest-rock, rather close to the brooding bird. The mate, which previous to the arrival had been sitting on a smaller boulder nearby, immediately flew up onto the nest-rock and assumed a belligerent attitude, whereupon the visitors hurriedly flew to another neighboring rock. After an apparently friendly visit of several minutes, all of the visitors, accompanied by the mate departed in a northerly direction.

This was the only pair of herring gulls found nesting on the tract, but doubtless others were to be found on some of the nearer lakes outside the boundaries, such as Moose and Round ponds, to the northeast and northwest, respectively, and visiting back and forth evidently took place.

23. **Black-billed Cuckoo** (*Coccyzus erythrophthalmus*). Summer resident of the region. June 3, 1933, the call of the cuckoo was heard just outside the boundaries of the Huntington Forest, at Newcomb; and on the 7th, within the tract, it was heard along the old Cold River road. No further record of the cuckoo was secured until the following year when an individual was seen in a patch of alders near the mouth of Deer Pond brook at Catlin Lake.

24. **Great Horned Owl** (*Bubo virginianus virginianus*). Year round resident. The hooting of the great horned owl was heard a number of times each season, and on two occasions the bird was seen at different points along the Deer Pond trail. It is probably fairly common on most of the tract.

25. **Northern Barred Owl** (*Strix varia varia*). Permanent resident. The barred owl was heard more frequently than the great

horned owl, and probably it is more common on the tract than is the latter, as is quite likely true for the Adirondacks generally (Ref. Eaton, Vol. 2; p. 115; 1914).

August 6, 1933, along the trail to Corner Pond, a barred owl flew up from a boulder in the dry bed of the outlet brook and lit on a low branch, where it remained for a few moments to scrutinize the intruder. August 12th, two individuals of this species were seen at different points on the same trail. At Wolf Pond the hooting of the barred owl was heard on three occasions during the week of June 4-10, 1934.

Chief Ranger Oja reported that in early February, 1934, he had caught a barred owl under rather interesting circumstances. He had come upon some impressions in the snow, at intervals of fifteen or twenty feet, that evidently had been caused by the body and wings of some large bird. The trail led him to a large snow-covered log under which was a bare spot ending in a tunnel in the snow. In this tunnel he found the remains of a ruffed grouse. He set a steel trap in front of the carcass and on a visit to the trap a few days later found a barred owl caught in it. To quote from the report: "The owl could only have put or 'cached' the carcass there by crawling underneath and pushing it far back in the tunnel of snow under the log and backing out. That the owl did the hiding of the carcass is evidenced by the fact that it was caught in the trap in front of the carcass which was both well hidden and far back under the log".

26. **Eastern Nighthawk** (*Chordeiles minor minor*). While the nighthawk is a summer resident in the Adirondack region, its distribution is more or less local. In the course of the present reconnaissance the bird was seen only once, August 23, 1933, when two individuals flew over Catlin Lake, evidently in migration.

It is possible that the nighthawk may be found more frequently in the more open areas in the southern part of the tract, in the general vicinity of Newcomb village. In the greater and more northerly part of the tract there are no bare ridges or slopes that would appear likely to attract this bird in the nesting season.

27. **Chimney swift** (*Chaetura pelagica*). Summer resident in the region. On the west shore of Catlin Lake are two stone chimneys on former club-house sites, that have remained standing since the buildings were burned several years ago. Chimney swifts were usually to be seen flying about above these sites, but so far as could be determined there was no evidence that the chimneys had been used as nesting places.

28. **Ruby-throated Hummingbird** (*Archilochus colubris*). Summer resident of the region. The hummingbird will probably be seen more frequently in certain of the more open areas bordering along the highway, as Rich Lake and the village of Newcomb. In most of the interior of the tract, however, this bird is likely to be seen only infrequently.

In the course of the present survey the Assistant Director, Mr. Dence, reported seeing a hummingbird near headquarters at Catlin Lake, August 21, 1933. On June 6th of the following year I saw a female hummingbird in the fringe of dead trees on the north shore of Wolf Pond. On the 10th of August my wife reported seeing two hummingbirds on the west shore of Catlin Lake; and on the 24th, one at the ranger's headquarters on the same shore.

29. **Eastern Belted Kingfisher** (*Megaceryle alcyon alcyon*). Summer resident in the region. The kingfisher was seen occasionally at all the lakes and ponds on the tract, throughout the month of August. During the early June visit, 1933, two kingfishers were seen at Rich Lake; but at Wolf Pond, June 4-10, 1934, the kingfisher was neither seen nor heard.

No banks or cuts such as are usually selected by the kingfisher for nesting places occur at the lakes and ponds in the northern part of the tract, but it is possible that a few such may be found in certain localities, not visited, about Belden or Rich lakes in the southeastern part of the tract.

30. **Northern Flicker** (*Colaptes auratus luteus*). Summer resident in the region. In the greater (northern) portion of the tract the flicker is the least common of the woodpeckers here listed, and it was seen or heard only a few times: August 8, 23 and 26, 1933; and August 15, 1934. It will probably be found more frequently in the vicinity of the highway and in the outskirts of Newcomb.

31. **Northern Pileated Woodpecker** (*Ceophloeus pileatus abieticola*). Permanent resident in the region. During August, 1933, one of these woodpeckers was seen on the 10th, at Wolf Pond; and on the 17th, at the northwest boundary. On June 6, 1934, one was seen at the Wolf Pond outlet, and during August of that season the pileated woodpecker was noted in a few localities on the east and west shores of Catlin Lake. On the morning of August 23rd, while I was tending some small mammal traps at the ranger's garden on the east shore of Catlin Lake, a pileated woodpecker remained in the



Fig. 291. Herring Gull nesting rock at left. The nest and eggs shown at right. June 6, 1934.



Fig. 292. Loon's nest with one egg on shore of small island at northern end of Wolf Pond. June 8, 1934.



Fig. 293. "The Fallow." Looking eastward. August 30, 1934.



Fig. 294. Beaver meadow at north end of Catlin Lake. August, 1933.

near vicinity throughout my stay. It was working quietly but industriously on some old trees at the edge of the clearing. The excavations of this woodpecker were conspicuous on many old stumps in various parts of the tract.

Rangers Oja and Phillips have reported seeing this woodpecker on the tract throughout the winter months.

32. **Yellow-bellied Sapsucker** (*Sphyrapicus varius varius*). Summer resident. This is the commonest woodpecker on the tract—as it is likewise in the entire Adirondack region (Eaton, '14, Vol. 2, p. 149). In the month of August many immature individuals were to be seen in various parts of the Forest visited, moving about in their characteristic quiet and unobtrusive way.

33. **Eastern Hairy Woodpecker** (*Dryobates villosus villosus*). Permanent resident. From my records of the two seasons the hairy woodpecker can hardly be termed common on the Huntington Forest, at least in the greater part of the Forest that lies to the north of Rich Lake. This woodpecker was recorded a total of fourteen times during the course of the survey: four times during August, 1933; four times at Wolf Pond, June 4–7, 1934; and six times during August, 1934, in other localities on the tract.

The nest of a hairy woodpecker, with young, was found, June 7th, in a dead tree near a section of the old Cold River road. The young were then large enough to cluster about the entrance and clamor vociferously for food.

34. **Northern Downy Woodpecker** (*Dryobates pubescens medianus*). Permanent resident of the region. The downy woodpecker was recorded nine times, as compared with fourteen times for the hairy, and this would seem to indicate that these two species have approximately the same numerical status on much of the Huntington Forest. Eaton ('14, p. 143) remarks that for the Adirondacks in general the downy woodpecker "barely equals" the hairy woodpecker in numbers.

During the period June 4–9, 1933, the downy woodpecker was not seen at all, but the hairy was recorded four different times.

35. **Eastern Kingbird** (*Tyrannus tyrannus*). Summer resident of the region, but not common on the greater part of the tract here concerned. On June 5, 1933, a kingbird was seen within the village limits of Newcomb. The bird may be looked for in the cleared areas on the Huntington Forest, in the general vicinity of the highway, but

in the more heavily forested parts it can be expected to occur only sparingly. During August, 1933, a kingbird was seen on the 9th, at Little Deer Pond; one on the 18th, at the marshy area (old flow, Fig. 294) at the head of Catlin Lake; and one on the 23rd, at the ranger's headquarters, west shore of Catlin Lake.

During August of the following summer the kingbird was not seen at all in the parts of the tract visited.

36. Northern Crested Flycatcher (*Myiarchus crinitus boreus*). Summer resident in the region. Not common on the Huntington Forest tract. June 5, 1933, at the old dam at the outlet of Rich Lake the harsh call of this flycatcher was heard, and presently the bird itself was seen, perched in a tree at the edge of the woods. This flycatcher was not seen during August of that season, but on June 6th of the following year one was seen in the fringe of dead trees on the north shore of Wolf Pond. August 13th, following, an individual appeared at headquarters at Catlin Lake, and on the 15th one was seen along the Corner Pond trail.

The crested flycatcher is a bird of the more open and warmer sections of the State, and in the Adirondacks, where it may, perhaps, nowhere be said to be actually common, it is to be looked for in the settled valleys at lower elevations, rather than in the higher and forested parts of the interior.

37. Eastern Phoebe (*Sayornis phoebe*). Summer resident in the region. My only records of the phoebe within the boundaries of the Huntington Forest are for June 2, 1933, when one of these birds was seen on the south shore of Rich Lake; and for August 10, 1934, when one was noted at a club-house site on the west shore of Catlin Lake. On this site there remains standing a wood-shed with open sides, offering apparently suitable nesting places for the phoebe, but no evidence of nests was found.

While the phoebe evidently is scarce in much of the interior of the tract, it is quite probable that it will be found more frequently in localities bordering Rich Lake and the highway.

38. Alder Flycatcher (*Empidonax trailli trailli*). Summer resident in the region, but apparently not common in the Huntington Forest. On August 7, 1933, an alder flycatcher was seen at one of the old club-house sites on the west shore of Catlin Lake. On August 10, 1934, two were seen along the northwest shore of Catlin Lake; and on the 21st one was observed in the alder bed near the mouth of Corner Pond brook.

39. **Least Flycatcher** (*Empidonax minimus*). Summer resident. The least flycatcher was found at various points along the old Cold River road, in the week of June 2-8, 1933, where more open conditions in the forest offer suitable habitats. At Wolf Pond, June 4-10, 1934, it was seen and heard daily; but during August, following, in the Catlin Lake district, only two individuals were seen. This is probably to be explained by the fact that the bird is silent at that season and hence easily overlooked.

40. **Eastern Wood Pewee** (*Myiochanes virens*). Summer resident. Common generally in the Huntington Forest. At headquarters, during August, 1934, the pewee was heard continually throughout the day until about the 20th, after which the intervals became longer, and during the last few days of the month it was silent. Then, on September 3rd, an individual note was heard again, and this was the last record of its call before my departure on the 7th.

41. **Olive-sided Flycatcher** (*Nuttallornis mesoleucus*). Summer resident. While probably not to be termed common on the tract, this flycatcher may be considered of regular occurrence in certain localities. June 3, 1933, it was found along the Cold River road, near the Rich Lake dam. In August of that season one of these flycatchers was seen near Long Pond, on the 4th; two on the 8th, in the dead-tree area at the head of Catlin Lake; one on the 14th, at Deer Pond; one on the 17th, in the old burn along the northwest boundary; and one again at the head of Catlin Lake, on the 18th. In the period June 4-9, 1934, three olive-sided flycatchers were seen at Wolf Pond.

42. **Tree Swallow** (*Iridoprocne bicolor*). Summer resident of the region. On June 7, 1933, a number of tree swallows were seen in an old flow south of Wolf Pond, where many tall dead trees probably offered nesting places. On June 4-8, 1934, at Wolf Pond, many of these swallows were seen, particularly at the outlet where, likewise, many dead trees occur.

43. **Barn Swallow** (*Hirundo erythrogaster*). Summer resident of the region. No records of the barn swallow were secured within the limits of the Huntington Forest tract proper; but in early June, 1933, this swallow was seen in the outskirts of Newcomb village, and it doubtless will be found from time to time coursing over the adjoining and more open areas of the Huntington tract.

44. **Northern Cliff Swallow** (*Petrochelidon albifrons albifrons*). Summer resident of the region. In the first week of June, 1933, a

pair of cliff swallows was found nesting under the eaves of the Wayside Inn, which is located at the edge of Newcomb and but a short distance beyond the boundaries of the Huntington tract. At that time I knew of no suitable nesting sites for this swallow on the Huntington tract, but since then barracks have been built for a CCC camp in a situation in the southern part of the tract which possibly may prove attractive as nesting places for cliff swallows, provided the buildings are left standing long enough.

45. **Northern Blue Jay** (*Cyanocitta cristata cristata*). Permanent resident of the region. While the blue jay was seen or heard in most parts of the Forest visited, it can hardly be classed as more than moderately common. Rangers Oja and Phillips have reported it present on the tract throughout the winter months.

46. **Eastern Crow** (*Corvus brachyrhynchos brachyrhynchos*). Common in the cleared areas in southern part of the tract. But in the greater and more heavily forested part of the tract the crow was seen or heard only occasionally: four times during August, 1933; twice during the week of June 4-9, 1934, at Wolf Pond; and three times during August (same season) in the Catlin Lake vicinity. Mr. Oja has reported the crow more common in the Catlin Lake locality, in March, and Mr. Phillips has reported it present on the tract in February.

47. **Black-capped Chickadee** (*Penthestes atricapillus atricapillus*). Permanent resident of the region. The chickadee is one of the commonest birds on the tract, and following the nesting season, especially, may be met with in little troupes throughout the Forest generally.

48. **White-breasted Nuthatch** (*Sitta carolinensis carolinensis*). Permanent resident of the region. While apparently not common on the tract, this nuthatch will probably be found to be of rather regular occurrence. The bird was not seen on either of my visits to the tract in June, but during August, 1933, three individuals were recorded on the 5th and one on the 7th, in the Catlin Lake district. In August, 1934, two were seen on the 9th, at Catlin Lake; and two on the 17th, at Corner Pond Brook. Mr. Phillips found it on the tract in February and March, 1933.

49. **Red-breasted Nuthatch** (*Sitta canadensis*). During the period of June 4-9, 1934, the red-breasted nuthatch was seen daily at Wolf Pond. In August of that season it was recorded on eight

different dates, and on three different dates during the first week of September, following. On August 15th a nest with young was found in a stub at Corner Pond. The young were then nearly ready to leave the nest and on my return to the place two days later I found that the entire family had departed.

According to Eaton ('14, p. 500), the red-breasted nuthatch is "a summer resident of the Canadian zone of New York, being very abundant throughout the Adirondack forests and in the Catskills above an altitude of 2000 to 3000 feet." Ranger Phillips has reported the red-breasted nuthatch in the Huntington Forest in February, and it is possible that the bird may here be classified as a common summer resident which occasionally remains through the winter.

50. **Brown Creeper** (*Certhia familiaris americana*). Summer resident of the region. The brown creeper is a rather inconspicuous bird and may be of more common occurrence than actual sight records indicate. It may be looked for in any of the forested parts of the tract. Records are for the following localities: Wolf Pond, June 4th, 5th, 6th; Corner Pond, Aug. 23rd; Catlin Lake vicinity, Aug. 10th, 11th, 23rd.

51. **Eastern House Wren** (*Troglodytes aëdon aëdon*). Summer resident of the region. Heard singing within the adjacent village limits of Newcomb, June 3, 1933, and it may be looked for in the more open parts of the Huntington tract in the vicinity of Rich Lake and the highway. In the greater and more heavily forested part of the tract the house wren may be expected to occur only sparingly. In the course of the present survey an individual was seen on August 28, 1933, near the mouth of Deer Brook, east shore of Catlin Lake; and on August 28, 1934, at headquarters on the west shore of this lake. A number of little clearings and old camp sites in certain parts of the Forest present situations in which it is quite probable that house wrens may occasionally be found nesting.

52. **Eastern Winter Wren** (*Nannus hiemalis hiemalis*). Summer resident in the region and generally common in the Forest. Records from the Catlin Lake district, Panther Mountain, the north-west boundary, Corner Pond Brook, Wolf Pond and other localities.

53. **Catbird** (*Dumetella carolinensis*). Summer resident in the region. June 6, 1933, the catbird was found within the village borders of Newcomb, but in the course of the present survey I did not find it within the boundaries of the Huntington tract proper. How-

ever, there is little doubt that the bird will be found occasionally on this tract, especially in the Rich Lake district and in localities adjacent to the highway and Newcomb village.

54. **Eastern Robin** (*Turdus migratorius migratorius*). Summer resident of the region. The robin was found to be common in the clearings of the southeastern part of the tract, in the vicinity of Newcomb. In the interior parts of the Forest it was met with only occasionally. During August, 1933, two robins were seen at the Catlin Lake headquarters (Fig. 285) on the 6th; one on the 21st; and one again on the 23rd. During the week of June 4-9, 1934, at Wolf Pond, the robin was seen but once. During the period from August 4th to September 7th, following, in the vicinity of headquarters, a total of what was considered to represent only five different individuals was recorded.

55. **Wood Thrush** (*Hylocichla mustelina*). Summer resident of the region. In the week of June 4-8, 1933, the wood thrush was found in a number of localities between Rich Lake and the highway, as well as in outskirts of Newcomb. In the interior parts of the tract it was not met with in any of the localities visited, but it is possible that it may occasionally be found in certain places, as, for example, along the old Cold River road.

56. **Eastern Hermit Thrush** (*Hylocichla guttata faxoni*). Summer resident of the region. Common in the Huntington Forest. On August 30, 1934, at the edge of a little clearing known locally as "The Fallow," on the west shore of Catlin Lake, I watched for some time a hermit thrush carrying food to a full-fledged young one that evidently represented part of a second brood of the season.

57. **Olive-backed Thrush** (*Hylocichla ustulata swainsoni*). Summer resident of the region, and common in the Huntington Forest. From my records it would appear that the olive-back and the hermit are on a very similar footing, numerically, on much of the tract.

On September 1, 1934, I examined a nest of the olive-backed thrush which the children at headquarters had found in a leaning birch on the lake shore. The nest, which had been deserted, contained four eggs. Examination revealed these to be in almost fresh condition, the yolks merely somewhat depressed and slightly adherent to the shell on one side.

58. **Veery** (*Hylocichla fuscescens fuscescens*). Summer resident of the region. During the week of June 4-8, 1933, the veery was

found in a number of localities in the area between Rich Lake and the highway. It was not met with in any of the localities visited in the northern part of the tract.

59. **Eastern Bluebird** (*Sialia sialis sialis*). Summer resident of the region. The bluebird will probably be found of regular if not common occurrence in more open parts of the tract in the Rich Lake district. In the greater and more heavily forested areas it will be found sparingly and only in certain localities where suitable habitats occur. For example, on June 7, 1933, a lone individual was seen in an old beaver flow containing a stand of dead trees, south of Wolf Pond; and on June 6th of the following year an individual was seen in the fringe of dead trees at the outlet of Wolf Pond. Another locality where the bluebird may be expected to be found in the nesting season is in the dead-tree areas at the head of Catlin Lake.

60. **Eastern Golden-crowned Kinglet** (*Regulus satrapa satrapa*). Summer resident of the region. The golden-crowned kinglet is partial to evergreen forests, and during the nesting season it will be met with rather sparingly in much of the Huntington Forest, in which hardwoods predominate. On my early June visits to the tract this kinglet was found only at Wolf Pond, but it may be looked for also in other localities, at that season, as for example, on the southeast shore of Deer Pond, where more or less spruce is found.

After about the middle of August, when the young of the season begin to move about, the golden-crowned kinglet becomes a much more conspicuous bird and it was then frequently found in family groups, foraging about in the tops of spruces and other conifers in various localities on the tract, such as Corner Pond, Panther Mountain, the vicinity of headquarters and elsewhere.

61. **Ruby-crowned Kinglet** (*Corthylio calendula calendula*). Transient visitant of the region. On my first visit to the Huntington Forest, on September 29, 1932, I recorded a ruby-crowned kinglet on the west shore of Catlin Lake; and on September 4, 1934, my wife saw one of these kinglets at headquarters on this lake. Except during the migrations, this kinglet will probably be found only infrequently in the Huntington Forest. There seems to be no certain record of the ruby-crowned kinglet nesting in the Adirondacks—nor, indeed, in the State (Ref. Eaton, '14, p. 511).

62. **Cedar Waxwing** (*Bombycilla cedrorum*). Permanent resident of the region and common on the Huntington tract. The cedar wax-

wing prefers more open conditions and is not to be looked for in the midst of the dense forest. It will be found about the edges of clearings, in old burns or flows and along lake shores and larger streams. It was noted daily at Wolf Pond, in early June; and later in the summer it was found to be of rather frequent occurrence at Catlin Lake, Deer Pond, Corner Pond, Rich Lake, and other localities.

63. **Migrant Shrike** (*Lanius ludovicianus migrans*). Summer resident of the general (?) region. On August 18, 1933, a shrike appeared at the head of Catlin Lake. A considerable patch of shrubby marsh occurs here, with a sparse stand of dead trees, the result of a former burn. The shrike remained in this locality for about an hour, perched on one or another of the old poles, and thereupon flew off in a southeasterly direction.

Conditions in the marsh prevented a close enough approach to permit certain specific identification of this shrike, but there is probably little doubt that it was the migrant shrike, a summer resident of the State, rather than the northern shrike, or winter visitant. Saunders ('29) found a pair of migrant shrikes in the general vicinity of North Elba, July 30, 1925, and a lone individual on August 12 of the following year. He considers this shrike not common in that region. In the Huntington Forest the bird can be classed, probably, as of occasional occurrence, only.

64. **Starling** (*Sturnus vulgaris vulgaris*). Permanent resident of the region. On my visit to the Huntington Forest, June 2-8, 1933, many starlings were noted at the village of Newcomb, and these birds doubtless are to be found occasionally in the neighboring open localities of the Huntington tract. In the interior parts of the Forest the starling was not seen during this survey, but Ranger Oja reported that in the spring of 1933, and again in the spring of the following year, "before the leaves were out," a starling had visited the grounds at headquarters on the west shore of Catlin Lake.

65. **Blue-headed Vireo** (*Vireo solitarius solitarius*). Summer resident of the region. Fairly common. In early June, 1933, this vireo was noted at Rich Lake and at various points along the old Cold River road; in August, in localities on the west side of Catlin Lake, and along the "old military road" on the east side. June 4-9, 1934, it was found also in the Wolf Pond district. During the following August, in the Catlin Lake district, it seemed to be nearly as common as the red-eyed vireo.

66. **Red-eyed Vireo** (*Vireo olivaceus*). Summer resident of the region. Common in the Huntington Forest, where its characteristic song was heard in all localities visited in the earlier part of the season. Beginning about the middle of August, 1934, there came a notable decrease in the vocal activities of the red-eyed vireos in the vicinity of headquarters at Catlin Lake. During the last week of that month they were not heard at all. Then on September 2nd and again on the 6th there came a sudden renewal of activity, which was the last singing of this vireo that I heard before my departure on the 9th.

67. **Black and White Warbler** (*Mniotilta varia*). Summer resident of the region. Fairly common in the Huntington Forest. In the first week of June this warbler was found in the Rich Lake and Wolf Pond districts, and in the month of August it was noted with considerable regularity and in a number of different localities. Six individuals were seen during the first week of September, 1934, in the vicinity of headquarters, Catlin Lake.

68. **Nashville Warbler** (*Vermivora ruficapilla ruficapilla*). Summer resident of the region. In the present survey this warbler was first met with, June 6, 1934, at the outlet of Wolf Pond, where a male was found singing in a little swampy area bordering the brook. On August 14th, same season, and again on the 27th, a Nashville warbler was seen in the alder bed bordering Corner Pond brook, at the point where the foot-bridge spans this brook near Catlin Lake. Two other records are for August 17th and September 1st, respectively, in the vicinity of headquarters.

Saunders ('29) found the Nashville warbler a "very common bird" in the St. Regis lakes and the North Elba regions. In the Huntington Forest its occurrence will be more restricted because of habitat conditions. However, in certain localities, as, for example, in the thickets and alder beds bordering the beaver flow at Deer Pond inlet, it is possible that this warbler may occasionally be found nesting.

69. **Northern Parula Warbler** (*Compsothlypis americana pusilla*). Summer resident of the region. During the week of June 2-8, 1933, in a grove of evergreens between the Rich Lake dam and Little Sucker Brook, a northern parula warbler was observed singing on two different occasions. On August 5th of the same season, a family group of parula warblers was noted on the west shore of Catlin Lake.

During the first week of June spent at Wolf Pond, 1934, two parula warblers were seen on the 6th, and one on the 7th. In the first week of September, following, in the vicinity of headquarters at Catlin Lake, a single individual was seen on the 1st, on the 3rd and on the 5th. The first of these was a bird that fluttered against a screen door at the headquarters cottage, about 8:30 in the evening and which, with the help of Mr. Oja, I succeeded in capturing.

70. Magnolia Warbler (*Dendroica magnolia*). Summer resident of the region. Common on the tract, in early summer, in localities containing second growth hardwoods intermixed with spruce and balsam. June 2-8, 1933, many magnolia warblers were seen in localities around Rich Lake and along the old Cold River road; many also in the Wolf Pond vicinity. June 4-9, 1934. In the Catlin Lake district it was seen only occasionally during August, and a single individual was noted here on the 1st and on the 3rd of September.

71. Black-throated Blue Warbler (*Dendroica caerulescens caerulescens*). Summer resident of the region. This warbler is a bird of the undergrowth in mature hardwood or mixed forest, and during the mating season, especially, it is therefore not frequently met with in the more open or marginal habitats. It may be classed as fairly common in the forested areas of the Huntington tract. Many were seen in the southeastern part of the tract, June 2-8, 1933; and in the Catlin Lake district, during August.

72. Myrtle Warbler (*Dendroica coronata*). Summer resident of the region. This warbler was common in the Wolf Pond district, June 4-9, 1934; and during August, when the young of the season were moving about, it was one of the commonest warblers met with in various localities in the northern portion of the tract, especially in the Catlin Lake district.

73. Black-throated Green Warbler (*Dendroica virens virens*). Summer resident of the region. This is another common warbler in the forested areas of the tract. It is to be looked for especially in the little clusters of hemlocks or balsams scattered throughout the Forest, from the upper branches of which its characteristic song often issues forth to betray its presence.



Fig. 295. Southern end of Deer Pond—looking northeast from outlet. August, 1933.



Fig. 296. Looking toward outlet of Deer Pond. Small bog occurs immediately to right of boat house in the middle distance. August, 1933.



Fig. 297. Portion of the Old Military Road. Between Ackerman Clearing and Wolf Pond trail. August, 1933.



Fig. 298. View of the Cold River road along Big Sucker Brook. June, 1933.

74. **Blackburnian Warbler** (*Dendroica fusca*). Summer resident of the region. During the period of June 2-8, 1933, in the localities visited in the Rich Lake district, this warbler was met with only twice; and in the closely corresponding period at Wolf Pond, the following year, it was seen but once. However, during August and the first week of September, in the extensive mixed forest of the Catlin Lake district, it was one of the most common of the warblers here listed.

75. **Chestnut-sided Warbler** (*Dendroica pensylvanica*). Summer resident of the region. This warbler apparently is not common on the Huntington tract, at least in the greater part of the property lying to the north of the highway. During observations in this area only three chestnut-sided warblers were noted. The first of these was a singing male found in an open glade bordering the old Cold River road near the point where it crosses Big Sucker Brook. On June 8th of the following year another singing male was found in the new growth of the dead-tree zone on the north shore of Wolf Pond; and on August 14th, following, a third individual was seen in the alder bed near the mouth of Corner Pond brook.

The mature forest is not a congenial habitat for the chestnut-sided warbler, and therefore this bird is not to be expected in any considerable numbers in the Huntington Forest. But there are certain localities in which, in the nesting season at least, it may be of more frequent occurrence than indicated by the few records here presented. Among such localities may be mentioned the old burn along the northern border of the tract, and the low growth bordering a part of Little Deer Pond outlet stream, in the beaver pond area. Slashings, old burns and sunlit glades containing young deciduous growth seem to be some of the habitats attractive to this warbler.

76. **Oven-bird** (*Seiurus aurocapillus*). Summer resident of the region. Common in the forested parts of the tract. It was noted in the Rich Lake district along the Cold River road, at Wolf Pond, and in various localities in the Catlin Lake district. Its song was last heard, in the season of 1934, on August 21st.

77. **Northern Water-thrush** (*Seiurus noveboracensis noveboracensis*). Summer resident of the region. The status of the water-thrush in the Huntington Forest is somewhat uncertain on the basis of my records for the period of the present survey. It is quite possible that more extended observations will reveal it as of regular

though perhaps not actually common occurrence along the water courses, the streams, especially, and in the swampy tracts that occur on some of them, and also in such localities as the large beaver flow on Little Deer Pond outlet stream.

On June 4, 1933, a water-thrush was noted singing at the edge of a swampy area on the south shore of Rich Lake. During August of the same year the water-thrush was not met with at all.

In the week of June 4-9 of the following year, this bird was neither seen nor heard in the Wolf Pond district; but in August it was found, on the 11th and on the 12th, at different points on Deer Brook. September 3rd, a water-thrush was observed along Corner Pond Brook, near Catlin Lake, and on the following day one was noted on a nameless brooklet between Corner Pond Brook and headquarters.

The water-thrush is silent and furtive in the latter part of the summer and may easily be overlooked. In the present survey no special effort was made to look for it. However, in some sections of the Adirondacks this bird appears to be of rare occurrence, for Saunders ('29, p. 384) states that neither he nor Dr. Francis Harper found the water-thrush during the course of two summers devoted to ornithological investigations in the Mt. Marcy region.

78. Mourning Warbler (*Oporonis philadelphia*). Summer resident of the region. The mourning warbler may be found to be of regular and possibly fairly common occurrence in certain suitable localities in the Huntington Forest. It is a bird of thickets, shrubbery, slash and old burns, but in the migrations may be found in other situations also. August 2, 1933, I found a mourning warbler caught in a mouse trap that had been set under a low bank at the mouth of Chase Brook, at headquarters (Catlin Lake). June 5, 1934, a singing male was observed for some minutes in a raspberry thicket in the dead-tree zone on the north shore of Wolf Pond.

In the latter half of the 1934 season the mourning warbler was seen on only six different occasions: Catlin Lake, August 10th; Deer Pond, August 11th; Corner Pond Brook, August 17th and 21st; Catlin Lake, September 5th and 6th.

79. Northern Yellow-throat (*Geothlypis trichas brachidactyla*). Summer resident of the region. Fairly common in suitable localities in the Huntington Forest. 1933: Rich Lake vicinity, June 2nd-8th, many seen; marsh at head of Catlin Lake, family of young, August 8th; Deer Pond, August 9th and 28th; Wolf Pond, August 10th.

1934; Wolf Pond, June 2nd; Catlin Lake, August 9th; Deer Pond August 12; "The Fallow", August 14th.

80. **Canada Warbler** (*Wilsonia canadensis*). Summer resident of the region. The Canada warbler was not met with in the localities visited in June of either season. In August, 1933, however, it was found, near Catlin Lake headquarters, on the 7th; at the north-west boundary, on the 12th; at Deer Pond, on the 28th; at the alder bed on Corner Pond Brook, on the 14th. On September 4th, an individual was seen near headquarters. This warbler is a bird of slashings and second growth, and in the nesting season will very likely be found to be fairly common in a number of localities on the tract where habitats of such character are available.

81. **American Redstart** (*Setophaga ruticilla*). Summer resident of the region. Many redstarts were seen, June 2-8, 1933, in the more open forests in the vicinity of Rich Lake. But in the heavily forested interior it was noted infrequently. The bird was not met with in the Wolf Pond district, June 4-9, 1934. And in August of both seasons the redstart was seen only a few times (August 9th, 14th, 21st) in the Catlin Lake and Deer Pond localities; and once on September 3rd, near headquarters.

82. **English Sparrow** (*Passer domesticus domesticus*). Permanent resident. Common at Newcomb village, and may occasionally be found along the highway westward from the village on the Huntington tract.

83. **Eastern Red-wing** (*Agelaius phoeniceus phoeniceus*). Summer resident of the region. In early June, 1933 season, the red-wing was found at the outskirts of Newcomb, but was not seen within the borders of the Huntington tract. It may, however, be expected to occur at times in the vicinity of Rich Lake. August 10th, of the same season, two red-wings appeared at the marsh at the head of Catlin Lake. In the 1934 season I did not see the species in any part of the tract visited.

84. **Baltimore Oriole** (*Icterus galbula*). Summer resident in cleared sections of the region. One seen at Newcomb, June 3, 1933. The Baltimore oriole may probably be of regular yearly occurrence in the clearings on the Huntington tract adjoining the village and the highway. On August 21, 1933, and again on August 10, 1934, a male Baltimore oriole appeared at headquarters at Catlin Lake;

but in the interior of the tract as a whole this bird will probably be found only occasionally.

85. **Rusty Blackbird** (*Euphagus carolinus*). Summer resident in the region. On June 3, 1933, at the little swamp (see Map 11) situated about three-quarters of a mile south of Wolf Pond, two rusty blackbirds were seen, apparently a pair, that were feeding along the little stream here found. August 17th, of the same season, two individuals of this species were noted in an old flow at the northwest boundary of the tract. A singing male was recorded at Wolf Pond, June 4, 1934, and another individual was seen at Deer Pond on August 31st, following. It is possible that this blackbird will be found nesting in certain localities on the tract.

86. **Bronzed Grackle** (*Quiscalus quiscula aeneus*). Summer resident in the region. Although the bronzed grackle was not found in the southeastern part of the Huntington tract, June 2-8, 1933, further observations will probably show it to be of more or less regular occurrence here, especially in the vicinity of Rich Lake. In the interior of the tract the bird was seen on a few occasions only, namely, in the marshy area at the head of Catlin Lake, August 8th, and at Wolf Pond, August 10, 1933; June 8, 1934, a solitary individual was seen at Wolf Pond.

87. **Scarlet Tanager** (*Piranga erythromelas*). Summer resident. June 28, 1933, the scarlet tanager was found to be rather common in the southeastern part of the Forest; and likewise in the Wolf Pond district, June 4-9, 1934. In August, when the bird was not singing, it was much less in evidence. A family of young scarlet tanagers was observed on the 9th, along the Deer Pond trail; and adults were noted along the trail to Wolf Pond and at Deer Pond, on the 10th and the 14th. On September 2nd, a male in changing plumage was observed near headquarters at Catlin Lake.

88. **Rose-breasted Grosbeak** (*Hedymeles ludovicianus*). Summer resident in the region. Apparently not a common bird in this area. It was not seen or heard on my June visits of either season. But on August 15, 1933, a male of this species was seen along the lower course of Panther Brook, and on August 11th of the following summer my wife reported seeing one near headquarters at Catlin Lake.

89. **Eastern Purple Finch** (*Carpodacus purpureus purpureus*). Summer resident in the region. The purple finch was not seen in

the southeastern part of the tract, June 2-8, 1933, but a solitary individual was seen on three different days during the week of June 4-9, 1934, at Wolf Pond. On August 20, 1933, a purple finch was seen near headquarters at Catlin Lake. On August 28th of the following season one was seen near headquarters, and on the 31st, several were noted at Deer Pond. This species will probably be found to be of regular and fairly common occurrence on the tract.

90. **Eastern Goldfinch** (*Spinus tristis tristis*). Permanent resident in the region. The goldfinch was noted as fairly common, June 2-8, 1933, in the more open areas of the Rich Lake district. During August of each of the two seasons, in the northern part of the tract, it was seen on a total of six different dates, and on two dates in the first week of September, 1934. Mr. Oja has reported the goldfinch on the tract in December, February and March.

91. **Eastern Savannah Sparrow** (*Passerculus sandwichensis savanna*). Summer resident in the region. The Savannah sparrow was found in a hay meadow at the outskirts of Newcomb. It was not seen on the Huntington tract, but it will doubtless be found in the occasional grassy clearings along the highway and in the vicinity of Rich Lake.

92. **Eastern Vesper Sparrow** (*Pooecetes gramineus gramineus*). Summer resident. The vesper sparrow was found at the outskirts of Newcomb, but not within the boundaries of the Huntington tract. It is quite likely, however, that this bird will be found in the old field areas in the vicinity of the Long Lake—Newcomb highway.

93. **Slate-colored Junco** (*Junco hyemalis hyemalis*). Summer resident. Common in various parts of the tract visited. A nest with eggs was found on June 2, 1933, along the Cold River road.

94. **Eastern Chipping Sparrow** (*Spizella passerina passerina*). Summer resident. Noted at Newcomb, and on the Huntington tract; probably it will be found common in the clearings along the highway. In the interior of the tract the chipping sparrow was found in only one locality, namely, the clearing known locally as "The Fallow", on the west side of Catlin Lake, where, on August 13, 1934, adult and immature individuals of what evidently were two family groups were seen.

95. **White-throated Sparrow** (*Zonotrichia albicollis*). Summer resident. Common, June 2-8, 1933, in the southeastern part of the

tract, in the Wolf Pond district, and especially in localities along the old Cold River road where slashings have resulted in attractive conditions for the white-throat. During August it was met with infrequently in the mature forest areas of the Catlin Lake and Corner and Deer ponds districts.

96. **Swamp Sparrow** (*Melospiza georgiana*). Summer resident of the region. The swamp sparrow was met with rather sparingly at Wolf Pond, Catlin Lake, Deer and Corner ponds. It may be looked for in various other localities on the Forest, where swampy thickets and marshy areas occur. It may be said to be of regular occurrence on the tract, but less common than the song sparrow.

97. **Eastern Song Sparrow** (*Melospiza melodia melodia*). Summer resident. Fairly common about the water courses, in localities where the forest is more open, with shrubbery, grass, low thicket, or more or less marshy conditions. Recorded at Corner Pond, Catlin Lake, and Wolf and Deer ponds.

MAMMALS

Trapping activities in the course of the present survey were limited to the small mammals, and confined for the most part to localities in the general vicinity of headquarters, on the west side of Catlin Lake. Limitations of time and of facilities rendered it inexpedient to carry on trapping in the larger part of the tract to the east and southeast of Catlin Lake where, because of distance from headquarters and difficulty of access, such operation would have required setting up temporary camps. Future work may be counted on to add to the following list a number of species which are known to occur in the general region and which sooner or later may be expected to be found within the boundaries of the Huntington Forest proper.

1. **Masked Shrew** (*Sorex cinereus*). Common in the vicinity of headquarters on the west shore of Catlin Lake where, under a low overhanging bank along a sandy stretch of beach, a dozen specimens were caught in the course of a few nights. One specimen was taken under a log near the mouth of Corner Pond Brook. Another, which was taken in a patch of grass at the mouth of Chase Brook, sprang the trap a moment after I had set it, as I turned to leave.

2. **White-lipped Water Shrew** (*Neosorex palustris albibarbis*). A specimen was taken on August 12, 1933, along Chase Brook; and one on the 19th, beside a brooklet a short distance north of headquarters, in which a few small pools remained, here and there. August 12, 1934, a third specimen was taken on this same brooklet, but repeated trapping on this as well as on Chase Brook and Corner Pond Brook, in their lower courses, failed to secure any more specimens of this species.

3. **Short-tailed Shrew** (*Blarina brevicauda*). Probably common locally. No effort was made to secure specimens of the short-tailed shrew, but rather to avoid it in order that more desirable forms might be taken. Nevertheless several fell victims to the traps. Two of these were taken near the water's edge along Chase Brook; one in a wet fern-covered spot near the head of Catlin Lake; one under the low overhanging bank where the masked shrews (above mentioned) were taken; one in dry woods in the vicinity of headquarters; and two in an open grassy spot along the southern shore of Rich Lake. In the last named locality as well as in certain others there were indications that the species is common.

4. **Hairy-tailed Mole** (*Parascalops breweri*). No specimen of this mole was secured and no certain evidence of its presence on the tract was noted, but I have seen evidence of its presence in the Long Lake district to the west, and it may be expected that sooner or later it will be found also in certain localities on the tract here concerned.

5. **Star-nosed Mole** (*Condylura cristata*). The Chief Ranger, Mr. Oja, reported catching a star-nosed mole at a garbage pit at headquarters. I secured no specimen of this mole in my rather limited trapping operations of the two seasons, but noted one or two localities in the northeastern part of the tract, especially, where I believe the species will be found.

6. **Brown Bat** (*Myotis lucifugus lucifugus*). In August, 1934, I received a specimen of the brown bat that had been captured by Ranger T. R. Phillips, in the southeastern part of the Huntington Forest. On a number of evenings, at headquarters, I noted one or two bats flying about, which apparently were of this same species; and on one occasion, in the summer of 1933, a larger individual appeared, with more direct flight, which may have been *Eptesicus f. fuscus*.

7. **Black Bear** (*Euarctos americanus*). Recent signs of bear were noted in various parts of the Huntington Forest, during both seasons. Such signs were particularly common in an old fern-covered burn near the northwest corner of the tract, where many decaying logs had been torn open or displaced, and where various scattered poplars bore the claw marks both of cubs and of larger individuals. Cloth posters at various points along trails and boundary lines also bore unmistakable evidence of "bear-work". Ranger T. R. Phillips reported that on May 15, 1933, he saw a mother bear accompanied by three cubs, on the east slope of Mt. Frio, in the southeastern section of the tract. Two of the cubs treed. The time was about 2:30 P.M.

8. **Raccoon** (*Procyon lotor lotor*). Tracks along water courses and other frequent signs, as well as reports from the rangers, indicated that the raccoon is fairly common in the Huntington Forest. One night in the latter part of August, 1933, a large dead lake trout that lay on the beach near headquarters, was dragged into the woods, and the tracks in the mud proved it to have been the work of the raccoon. At the onset of winter, 1934, Mr. Oja had a tame raccoon which had been provided with denning quarters under the cottage porch. Later this individual was joined by two wild ones which shared its quarters until spring, when all three departed.

9. **American Otter** (*Lutra canadensis canadensis*). A few otters may be expected to be of fairly regular occurrence within the tract. Tracks were noted on the beach at the north shore of Wolf Pond in August, 1933, and in June, 1934. In August of the latter year I noted otter tracks also on the southeast shore of Deer Pond. Chief Ranger Oja reported seeing tracks and "slides" along Deer Pond and Wolf Pond brooks, in February, 1933. Early in January 1937, he saw three large individuals near the Rich Lake dam.

10. **Eastern Skunk** (*Mephitis nigra*). Probably fairly common in the clearings in the southeastern portion of the tract, but less common in the forested interior. I noted evidence of the skunk along the Cold River road and at Wolf Pond in June; and in various localities on the west side of Catlin Lake, during August. Mr. Oja reported that on April 15, 1933, he saw a skunk at his garbage pit at headquarters. In the same month Mr. Phillips found a skunk that had been killed on the highway, in the southeastern part of the tract.

11. **Mink** (*Lutreola vison*). In February, 1934, I received from Mr. Oja the carcass of a mink that he had taken on Deer Pond

stream. August 23, 1934, another specimen was taken at Deer Pond, in a trap set for a porcupine which had gnawed a hole through the wall of the boathouse. Mink tracks were noted at various points along the lakes and larger streams on the tract, where the species may be considered fairly common.

12. New York Weasel (*Mustela noveboracensis noveboracensis*). No weasels were seen in the course of the present survey, but in May, 1934, I received from Mr. Oja the carcass of a New York weasel which he had taken in a trap at headquarters. During the winter both Mr. Oja and Mr. Phillips reported having seen the tracks not only of this large weasel, but also those of a much smaller one which doubtless was *Mustela cicognanii cicognanii*. From the number of tracks noted in the winter, Mr. Oja considers weasels to be relatively scarce on the Huntington Forest.

13. Red Fox (*Vulpes fulva fulva*). Rather common. Rangers Oja and Phillips have reported seeing the red fox in various parts of the tract, in winter, besides much evidence in the form of tracks and other signs. In the course of this survey I noted fox tracks frequently on the beaches of Catlin Lake and Deer and Wolf ponds, and also excrement at various points along the trails. On a few mornings at Catlin Lake I found fresh tracks on the beach, within a stone's throw of the headquarters cottage.

At about 5:30 P. M. on August 7, 1933, on the knoll known as "The Fallow" (Fig. 293), I watched a red fox for a period of about fifteen minutes while it was feeding on ripe raspberries, a patch of which grew in a hollow in the center of this knoll. With the breeze in my favor and with the aid of a six-power binocular I was able, undetected, to observe this fox closely, from an elevation perhaps a hundred-and-fifty feet distant. It moved slowly from shrub to shrub, nipping off the berries. Its fur was long, faded and shabby on the back and on part of its tail, while its head and the rest of its tail were clothed with shorter and brighter new fur. The animal probably was a female that had nursed a litter of young during the season.

In the spring of 1934, Mr. Oja found a recently dead fox near the Corner Pond boathouse. No external marks of injury were noted.

14. Rufescent Woodchuck (*Marmota monax rufescens*). The woodchuck occurs only sparingly in the more heavily forested parts of the tract, but will doubtless be found more commonly in the clearings of the southeastern section. In June, 1935, Assistant Director

Dence reported seeing a woodchuck on the peninsula (island during high water) at the east end of Rich Lake; and during our stay at Wolf Pond, June 4-9, 1934, a woodchuck was seen repeatedly, close to our camp, where it evidently had its den in a hollow among boulders and tree roots on the bank.

Evidence of woodchucks was noted also at the site of an old logging camp along the Cold River road, south of Wolf Pond, and at a club-house site on the west shore of Catlin Lake.

15. **Chipmunk** (*Tamias striatus lysteri*). Fairly common in the vicinity of headquarters, where a few individuals were to be seen daily, but not frequently met with in other parts of the tract visited. At Wolf Pond, for example, during the week of June 4-9, 1934. I saw but one chipmunk in the vicinity of our camp, and although I had a score of traps set in this vicinity for the greater part of our stay, no chipmunks (or any other small mammals, for that matter) were taken in the locality.

Mr. Phillips reported seeing the first chipmunks of the season on March 21 and 27. Mr. Oja gave April 1 as the date on which he saw the first chipmunk at headquarters; and on the 10th of the month he noted much activity among the chipmunks in a white pine plantation on the tract, south of the Long Lake-Newcomb highway.

16. **Canadian Red Squirrel** (*Sciurus hudsonicus gymnicus*). Fairly common in localities where clusters of seed-bearing spruces and balsams occurred, but not much in evidence generally throughout the hardwood forest.

17. **Northern Gray Squirrel** (*Sciurus carolinensis leucotis*). Mr. Oja reported that on September 25, 1933, he came upon a gray squirrel that was swimming across Long Pond, near the southwestern boundary of the tract. When he extended an oar to it the squirrel clambered into the boat, jumped out on the opposite side and continued on its course.

In the fall of 1934 he saw two gray squirrels below "the pass" connecting Catlin Lake and Long Pond. And in September, 1935, reported seeing three individuals that were swimming across Catlin Lake (one near headquarters and two near the outlet), and two that were on a log near "the pass."

18. **Mearns Flying Squirrel** (*Glaucomys sabrinus macrotis*). Probably fairly common. Mrs. Oja reported seeing one at headquarters, November 6, 1932; and on November 22nd, Mr. Oja saw

one at Sabattis Pass, which had its nest in an old stub. I have in my possession the tail of one of these flying squirrels, found by Mr. Oja near the mouth of Deer Pond Brook. The body had been devoured by some predator.

19. **American Beaver** (*Castor canadensis canadensis*). Beaver were found established in various localities in the northwestern part of the tract, such as at Deer Pond, on the inlet stream of this pond, Wolf Pond stream, Round Pond outlet and at Lake Belden. In the 1933 season the animals had a lodge and a dam also at the mouth of Corner Pond Brook, but these were found abandoned the following summer. On the morning of August 16, 1933, I observed a beaver swimming across Catlin Lake, coming from the east shore. It landed for a brief stop on the west shore, just below the headquarters cottage, then re-entered the water and continued on its course southward. Scattered recent cuttings in widely separated localities along the shores of the various lakes indicated a considerable roving about of such individuals.

20. **Muskrat** (*Ondatra zibethica zibethica*). Evidence of the muskrat was found here and there along the shores of the lakes, as well as on some of the streams, particularly the northwest inlet of Catlin Lake, the east inlet of Deer Pond and on Wolf Pond stream. On the Deer Pond inlet and on Wolf Pond stream beaver dams of long standing have created more extensive areas of suitable muskrat habitats than I found in any other single locality on the tract.

Clams of at least three species are abundant in the shallower water of the lakes on the Huntington Forest, and that the muskrat had been feeding extensively on this food was attested by the numerous shell heaps found along the shores. In fact, in most places along the shores of the lakes on the tract, clams seemed to be the principal food available to the muskrat. Aquatic vegetation was here rather scarce and I saw no evidence that the animal had gone beyond the shore line and into the forest in search of vegetable food.

21. **Cooper Lemming Mouse** (*Synaptomys cooperi cooperi*). August 7, 1933, two specimens, a male and a female, were taken in a grassy area marking the site of a former club-house on the west shore of Catlin Lake. August 9th, the following year, two more specimens (females) were taken in the same clearing; on the 18th, a male was taken under an overhanging bank on Corner Pond Brook, near Catlin Lake; on the 28th another male was taken in a small

gully (not far from the above mentioned grassy clearing), and on the 29th an immature female was taken at the same spot.

The lemming mouse or bog lemming is recognized as rather local in distribution, and it may be expected to be found also in various other parts of the tract where suitable habitats occur.

22. Meadow Mouse (*Microtus pennsylvanicus pennsylvanicus*). The meadow mouse will, undoubtedly, be found common in many localities where typical habitat conditions for this species occur, as, for example, in the clearings in the vicinity of Rich Lake and the highway. In the parts where most of the trapping was done, however, such habitats were both few and limited in extent, and the meadow mouse population correspondingly small. Specimens were taken in two of the same localities where *Synaptomys* was secured; in a grassy hollow on the knoll locally known as "The Fallow;" at Corner Pond; in a grassy plot adjacent to the ranger's garden on the east shore of Catlin Lake; and in a patch of meadow near the south-east shore of Rich Lake.

23. Red-backed Mouse (*Evotomys gapperi gapperi*). Common in localities on the west side of Catlin Lake, and doubtless common also throughout the Forest generally.

24. LeConte White-footed Mouse (*Peromyscus maniculatus gracilis*). Common in the woods. During August, 1934, traps set in brook beds, whether at the water's edge, under overhanging banks or in open spaces in the drier parts of the brooks, caught no specimens of *Peromyscus*; but during the previous August several specimens were taken in such places. A good many were caught by Ranger Oja at various places within the buildings at headquarters.

25. Northern White-footed Mouse (*Peromyscus leucopus noveboracensis*). While no specimens of this form were taken in the course of the present reconnaissance, it will probably be found to occur about the clearings in the southern part of the Huntington tract and adjacent to Newcomb village. I found this species common about 20 miles southeast of Newcomb, in the Olmstedville district in the summer of 1935.

26. Jumping Mouse (*Zapus hudsonius hudsonius*). Not common in the Catlin Lake district where most of my trapping was carried on. In June, 1933, in a grassy area bordering the highway, in the vicinity of Rich Lake, I had a glimpse of what evidently was one of these jumping mice, and in this part of the tract the species prob-



Fig. 299. Corner Pond. View north from outlet. Kempshall Mountain in the distance. August 6, 1933.



Fig. 300. Little Deer Pond. This pond is the result of a beaver dam. It was inhabited with black ducks during August, 1933.

ably will be found more common. There are also certain localities in the northern portion of the tract where it may be expected to occur more or less commonly, but where I have as yet had no opportunity to trap.

In the Catlin Lake district, during the 1934 season, I made a special effort to secure specimens of the jumping mouse, and set traps in a number of likely looking localities. But only two specimens were secured. These were an adult and an immature female taken at the same spot within the ranger's garden fence, in an area containing a sparse growth of grass, weeds and small shrubs.

27. Woodland Jumping Mouse (*Napaeozapus insignis insignis*). Fairly common in the Catlin Lake district. Of 11 specimens trapped, 10 were taken in the general vicinity of headquarters, and 1 in an old burn at the head of Catlin Lake. On June 6, 1933, on the peninsula at the east end of Rich Lake, I started one of these jumping mice which, after the first jump or two, crouched between two stones within arm's reach, affording me a good opportunity for identification. On September 6, 1934, on Chase Brook, I started another woodland jumping mouse, which I succeeded in capturing, and found it to be a young female, about half adult size. When released, it darted into a hole under a stump.

28. Canada Porcupine (*Erethizon dorsatum dorsatum*). Although I made no effort to find porcupines, I met with two in the southeastern part of the Huntington Forest, during June 2-8, 1933, and two in the northwestern part during August of that season. Another porcupine held forth in the vicinity of our camp at Wolf Pond, during June 4-9, 1934. The rangers reported considerable activity of the porcupine during the winter. I saw no evidence of any considerable number of porcupines on the tract, and nothing that could be classed as damage to timber by this animal.

29. Varying Hare (*Lepus americanus virginianus*). The summer season is not a favorable one for seeing the varying hare in such territory as that of the Huntington Forest—without special efforts—and I did not see the animal during the course of this survey. However, such evidence as droppings and tracks were noted in a number of localities, and indicated clearly enough its presence. Recent signs were particularly common in certain areas of dense, cool, spruce woods on the southeast shore of Deer Pond. Tracks were occasionally noted also on the beaches in some places, as at Rich Lake.

Deer Pond and elsewhere. During the four winters in which the rangers have been on the Forest, they reported seeing the varying hare occasionally, and noting an abundance of tracks and well-beaten runways in certain localities.

30. **Cottontail** (*Sylvilagus* sp). The cottontail is said to occur near Newcomb but there are no authentic records of its occurrence on the tract itself. However if it does occur in the general region there is a strong possibility that it may also be found on the tract.

31. **Northern White-tailed Deer** (*Odocoileus virginianus borealis*). Common. Deer in varying numbers were to be seen daily. The low stage of the lakes during both seasons attracted many deer to some of the exposed beaches and flats on which a sparse but evidently succulent vegetation had sprung up by the latter part of the summer. The majority of the deer seen consisted of does and fawns. In certain more secluded localities, older bucks were to be seen quite regularly. Younger bucks not infrequently came out to feed on beaches at Catlin Lake, within good view from headquarters.

Inasmuch as the Huntington tract has been closed to hunting for some years, there seems to be an impression in certain quarters that the results of protection should be manifested by a denser deer population here than is found in the surrounding territory where more or less hunting has taken place. In the existing situation, however, no numerical difference attributable to this factor is reasonably to be expected, and in fact no indications suggesting such a possibility were noted.

The Huntington Forest is practically surrounded by a contiguous vast deer-inhabited wilderness with equally attractive habitat conditions. The deer are free to cross the boundaries between the two at will, and practically at any point. The width of the Huntington tract being no greater than about three or four miles, it is indeed a question as to how large or how small a part of the deer population on the tract at any given time may be classed as a resident population in the sense that it remains continuously within its boundaries the year round. It may be taken for granted, I think, that both the size and the individual constitution of the deer population on this area are subject to considerable fluctuation. Seasonal fluctuations may of course be expected to be the most pronounced, but there are doubtless fluctuations over more frequent periods, also, as suggested by the following considerations.

By referring to map 11 it will be noted that the lakes and ponds of the major and northern portion of the tract are situated well toward its outer edges. Taking Catlin Lake as an example, it may be considered very probable—and trails tended to bear this out—that the majority of the deer that come out to feed along the west shore of the lake, spend much of the rest of the time beyond the southwestern boundary of the tract. Likewise those that come out on the east shore and near the upper end of the lake very probably cross and recross more or less frequently the northwestern boundary. Similar comings and goings across the line may safely be postulated not only for many of the deer visiting Wolf Pond and Deer Pond, but also, in fact, for practically all the border-line territory on the northeast, northwest and southwest sides, especially.

As is true also of the surrounding territory, the food supply for deer within the Huntington tract proper is abundant, and more than adequate for any deer population that normally is likely to be found within its borders. Only in the event of snow deep enough to prevent any deer, that might at the time be found on the tract, from moving about or reaching their food, does it appear at all probable that any serious hardships might befall the animals due to lack of sustenance. But the same predicament would then, of course, confront deer in all the surrounding territory, too. I have, however, seen no evidence pointing to any winter stress among deer from this cause on the Huntington Forest, but should any such emergency arise the obvious recourse would be to the artificial deer food prepared for the specific purpose by the State Conservation Department. This food is put up in convenient form for quick distribution to localities where needed.

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PART II. PRELIMINARY RECONNAISSANCE OF THE WATERS OF THE ARCHER AND ANNA HUNTINGTON WILD LIFE FOREST STATION AND THEIR FISH INHABITANTS

By

W. A. DENCE, *Assistant Director*

*Roosevelt Wild Life Forest Experiment Station
Syracuse, New York*

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INTRODUCTION

The Archer and Anna Huntington Wild Life Forest Station is located in the eastern part of the Adirondacks near the village of Newcomb. The greater part of its 13,000 acres lies in Essex County and the remainder (northwest corner) is in Hamilton County. Originally the Huntington property was nearly rectangular in shape—approximately $7\frac{1}{4}$ miles long and $3\frac{1}{4}$ miles wide—with the longest axis extending in a northwest-southeast direction. A section at the western boundary, comprising about 2000 acres and known as the Arbutus Preserve, has been reserved by the donors of this property.

The lakes and ponds of the tract have a total area of approximately 1200 acres. Of these Catlin Lake, with an area of 531 acres, is by far the largest. Wolf and Deer ponds, the greater portion of Long Pond, Rich Lake and Belden Lake, as well as a small portion of Corner Pond, are included in the college property.

The tributary streams of the above lakes and ponds are short and rather non-productive in so far as game fish are concerned. While most of them contain a few native trout of legal size I believe that, in general, they are more valuable as nursery waters for this species. Certain species of minnows and suckers, such as common shiners, horned dace, black-nosed dace and dwarf suckers, spawn in the streams in the spring or early summer and their offspring eventually enter the lakes and ponds to augment the supply of forage fish available for the predacious game species. In some of the ponds where cannibalism is very common these minnows play a prominent part in conserving the supply of juvenile game fish. The yellow perch, for example, reaches an immense size for that species, particularly in Catlin Lake, but this growth has been attained at the expense of a good many other fish, including small perch. Since angling is not permitted on the tract most of the large adult perch remain year after year as the dominant species. In all probability only a small percentage of each year's hatch of perch is able to escape the enemies and thus reach the adult stage. Gill nets set at various places yield only large adult perch, and furthermore, very few young perch are ever seen or caught in shallow water. It is quite certain that the loss would be greater, even approaching extinction, were it not for the fact that the supply of food is supplemented annually by a large number of small coarse fishes such as suckers and dace.

The fact that the streams are relatively short precludes any possibility of their producing many trout of legal size. While there is

a great volume of water in the Spring, as well as in periods of heavy rainfall, the streams subside very quickly thereafter and in drought periods, such as occurred in the summers of 1933, 1934 and 1935, some of them carry scarcely any water. The author is of the opinion that most of the stream-inhabiting fish descend to the lakes and ponds during such periods. This is substantiated by the fact that only a small portion of the early Spring population becomes stranded as the streams reach the low ebb. Those that do remain in the streams during times of drought usually are able to exist as long as there is sufficient water to cover their backs because the pools generally contain cold fresh water. In several instances trout fry have been observed in isolated pools that were scarcely an inch in depth and less than a foot in diameter. The late Dr. C. E. Johnson told me about a small pool of this sort that he observed in a little tributary of Catlin Lake during August, 1934. Upon investigating the cause of a slight movement in this pool from what he thought might be a small frog, he was surprised to find a fingerling brook trout. Since there was scarcely enough water to cover the trout, he decided to move it to a larger pool only a few feet away. This was very fortunate for the trout, because in less than twenty-four hours the pool that it formerly occupied was dry.

Stream improvement work cannot be applied advantageously to the streams of this tract because the primary essential—proper volume of water throughout the year—is lacking. In other respects the physical make-up of the streams appears to be quite ideal for trout. Little Sucker and Big Sucker brooks were studied in June, 1933, and found to be well stocked with brook trout. Both streams suffered severely from the drought of the following two months and again for a similar period during the summer of 1934 with the result that the fish population was greatly reduced. In due course of time the survivors should reproduce and then restock the stream naturally. Unless trout migrate from Rich Lake to these streams we may expect only a small population there during the next few years even if normal precipitation should prevail in the summer months. The other streams on the tract were not visited prior to the drought periods, but inasmuch as they have a striking similarity to the above mentioned streams it may be assumed that their earlier fish population was quite similar to that of the two Sucker brooks.

It will be very interesting to watch these streams during the next few years, as they remain unaided by artificial measures, and follow their successive changes in fish population.

In certain respects, particularly as regards the flora, the lakes and ponds of the tract are strikingly similar. The similarity of the gross aquatic vegetation in the various lakes and ponds was noted by Muenscher ('33, p. 225) who reports as follows: "The composition of the weed areas of Harris, Rich and Catlin lakes is rather similar so far as the predominating species are concerned. *Potamogeton natans*, *P. epihydrus*, *P. pusillus*, *P. dimorphus*, *Sparganium fluctuans*, and water-lilies, *Brasenia schreberi*, *Nymphaea odorata*, and *Nymphozanthus advena* were the dominant species. In shallow water along sandy or gravelly shores *Isoetes echinospora* var. *Braunii*, *Eriocaulon septangulare*, *Lobelia Dortmanna* and *Myriophyllum tenellum* form a dense growth. *Nitella tenuissima*, *N. megacarpa* and *Chara coronata* var. *Schweinitzii* were abundant in from 2 to 4 meters of water in all these lakes."

All of the lakes and ponds with the possible exception of Wolf Pond contain introduced species of fish. These forms undoubtedly have brought about radical changes in the fauna of these waters particularly as regards the indigenous game and food species. The results of my studies indicate that the introduced yellow perch, for example, is the predominating fish in Catlin Lake and Deer Pond while in Rich Lake, the yellow perch has a strong competitor in the great northern pike, another introduced species.

The waters of the tract have not been artificially restocked in recent years and, excepting Rich and Belden lakes, have not been disturbed by anglers for a similar period, hence the struggle for existence may be considered natural. In the case of Rich Lake this struggle is affected by anglers who remove considerable numbers of the highly predacious pike as well as a few yellow perch and common bullheads. It would appear that were it not for man's influence in checking the natural increase of pike in this lake that species would undoubtedly dominate the yellow perch, its greatest competitor, within a few years, because of its greater size and more voracious habits unless some natural check, such as disease, should take place.

A few anglers test their skill at casting for black bass in Belden Lake, but very few fish are taken in this manner. The author has actually seen only one black bass taken from this lake and that was an undersized large-mouth. The small-mouth is said to occur here also. Rock bass and sunfish are fairly common and a few are caught by anglers, particularly by women and children. Some of these are thrown back, a few are left on shore to perish, while others are used for food. In general the total of all species taken from this lake is

rather insignificant and therefore has no appreciable influence on the natural processes in the struggle for existence.

The dam* at the foot of Rich Lake serves as a barrier to fish migrating upstream, consequently black bass, rock bass and perhaps certain other species of fish in Belden Lake, Harris Lake and adjacent waters, are unable to get beyond Belden Lake and become established in other waters of the tract.

Common suckers, both the large and the dwarf forms, occur abundantly in all the lakes and ponds. Gill nets set in these waters seldom fail to capture large suckers especially if the depth is under forty feet. The dwarf form, however, is seen only during its spawning season when it enters the small inlet tributaries of the various lakes and ponds. Suckers are considered valueless by anglers and are seldom if ever taken for food in the lakes where fishing is permitted.

In addition to the predacious fish in the waters of the Huntington Forest there are several species of birds and mammals that feed more or less extensively on fish. Fortunately, however, none of these species becomes overabundant. Their existence, on the other hand, is more or less justifiable for they add materially to the attractiveness of the tract from the standpoint of the biologist and the recreationalist.

A few pairs of herring gulls and common loons are to be found on the tract during the spring and summer months, but the population on any particular body of water varies considerably due to a few roaming individuals. One seldom sees more than two pairs of either species on the same pond or lake at the same time. In early June, 1934, a pair of gulls was nesting on a rock in Wolf Pond and not far away a pair of loons had a nest at the edge of a small island. These appeared to be the only nests of predacious birds on the pond and yet on a number of occasions visiting birds were seen.

Bald eagles were very scarce. I saw only one pair during the summer of 1933 at Catlin Lake. One of these birds was about to pick up a large dead lake trout from the surface of Catlin Lake on the morning of August 20, 1933, when it was frightened by Mr. Oja. Bald eagles probably take very few, if any, healthy live fish from these waters, except perhaps in late spring and early summer when certain species are spawning in shallow water.

A brood of mergansers was seen almost daily on Catlin Lake during each of the two summers spent there. They worked along the shore within the five-foot contour. Small sunfish, horned dace and suckers

* This dam disappeared during the high water early spring, 1936.



Fig. 301. Typical view of mid-section of Deer Creek. Pools usually occur behind large boulders as in left foreground, August 14, 1933.



Fig. 302. Trout pool in Wolf Creek near upper beaver dam. Several trout were hiding in the pool adjacent to the large boulder shown in left foreground, August 10, 1933.



Fig. 303. Wolf Creek at Wolf Pond. A portion of the pond may be seen just beyond the large boulders in the middle distance. August 10, 1933.



Fig. 304. Typical view of Wolf Creek about one-fourth mile below the pond. August 10, 1933.

were the principal species observed there and it is presumed that these species suffered the greatest losses. Mergansers also have been seen quite regularly on Rich Lake in considerable numbers, but only occasionally on the other waters.

Only one fish hawk was observed on the tract. This individual was circling rather high over Rich Lake on June 5, 1933, with a large fish in its talons. It finally disappeared in the tree tops of a mountain to the east of the tract. The late Dr. Charles E. Johnson observed what he assumed to be the same bird on the following day. The fish hawk, however, is really too scarce to have any appreciable effect on the fish population.

Belted kingfishers were seen occasionally along the outlet of Rich Lake and about the west shore of Catlin Lake north of headquarters. A few minnows and other small fish are taken by this bird, but here again the loss is scarcely worth mentioning. The kingfisher is such an interesting creature that one does not begrudge the few fish it eats.

Great blue herons are seen occasionally on the tract, particularly about Rich Lake and Deer Pond. A dwarf sucker about seven inches long, which was taken on its spawning ground at the lower end of Big Sucker Brook, bore a deep wound, slightly in front and below the dorsal fin, of the type made by this bird. The fish was alive and very active despite its ragged appearance. Generally this heron was seen in the shallow weedy areas where minnows and sunfish were plentiful. In Deer Pond the area about the outlet was a favorite hangout. Another popular area was noted in the outlet of Rich Lake particularly at the mouth of Big Sucker Brook.

In addition to the above fish-eating birds, there are certain mammals that on occasion may take a few fish. We know that raccoons, mink, foxes and bears are fairly common on the tract and in addition there is also a possibility that the otter may be present. Raccoon tracks, in particular, but occasionally those of foxes and bears are seen in the sand and mud about the shores of the various waters. While there may be various reasons for their presence here, it is quite likely that fish are taken at times. The greatest loss naturally would occur during the spawning season when certain species enter the shallow water of the lakes and ponds or the riffles of the streams. In early June, 1934, while conducting field studies in the Wolf Pond region I found that the spawning grounds of the sucker were being visited quite regularly each night by some predatory animal, the identity of which I was unable to determine with such meagre evidence as was available. The animal in question

usually consumed the entire fish with the exception of the head which in nearly every case had been neatly severed from the body. The heads were usually found in the water but occasionally some were on the sand and gravelly shores. One freshly killed sucker was found with the belly and viscera removed. Two other dead specimens showed tooth or claw marks, but had not been touched otherwise.

I am inclined to believe that raccoons had taken these fish, but mink or otters may have been guilty of the offense. The mystery could have been solved had it been possible to obtain a good impression of the animal's footprints. While the gravel and sand were more or less scuffed up there were no distinct foot impressions. The work at both the north and south inlets of Wolf Pond was very similar.

The drought of the past two summers undoubtedly was favorable for predatory animals at the outset, but when the water became so low that the majority of fish worked downstream and entered the larger bodies of water the streams ceased to be attractive. There was no evidence of the wholesale capture of fish accidentally landlocked in pools although it seems that fish in such a predicament would fall an easy prey to their enemies.

The volume of water in the lakes and ponds of the tract was greatly reduced during the drought, but the effect was not as disastrous as in the case of the streams. Considerable areas of beach were exposed, but in general these places had previously been quite barren of plant life and thus had little value as foraging grounds for fish.

ANNOTATED LIST OF FISHES

Lake Trout (*Cristivomer namaycush*)

Catlin Lake is the most important habitat of lake trout on the tract. In fact it was considered the only habitat until last summer (1934) when a single specimen was obtained from Rich Lake. Since this fish characteristically inhabits the deeper parts of the lakes most of the year, little is known regarding its numbers. However, such information as we have, indicates that it is fairly common in Catlin Lake, but rare in Rich Lake.

Only adult lake trout have been found on the tract. A 27-inch male, with very large spermaries and weighing $6\frac{3}{4}$ pounds, died on August 20th and was recovered from the surface of Catlin Lake near headquarters in perfectly fresh condition. There were no indica-

tions of injury or disease. Furthermore, the fish was fat and showed every evidence of being in normal health. While there were a few small tapeworms in the pyloric region, these alone would not seriously affect the health of the fish. The digestive tract of the trout was empty. It has been reported that a small number of lake trout succumb each year in this manner, particularly during August and September, but the cause of death is unknown.

On October 24, 1933, Mr. Oja wrote the late Dr. Johnson as follows: "That evening, October 17th, accompanied by Phillips, we saw quite a number of unusually large trout spawning among the rocks that are exposed at the 'narrows' toward the north end of Catlin Lake. Among the large trout we saw a number of smaller suckers (although as suckers they were large—18–24 inches) hanging about like so many calves. Some of the trout were fully three feet in length. I had been on the same spawning shoals a number of times earlier this month, but saw nothing until October 17th. The next day I observed, on going back there, that in spots where the fish had been most numerous the stones had been brushed free of their slime and algae. . . ." The fish that Mr. Oja saw were probably lake trout.

Lake trout are predacious and feed on a variety of fish—game species included. They have very capacious stomachs. Two medium-sized specimens taken from Skaneateles Lake at Borodino, N. Y., in December, 1931, yielded 14 fingerling yellow perch each. Perhaps many of the small perch at Catlin Lake meet a similar fate and this may account in part for the relatively small numbers occurring there.

Brook Trout (*Salvelinus fontinalis*)

The native brook trout occurs in most of the streams as well as in some of the lakes and ponds of the tract. I have actual records for the streams, Catlin Lake and Corner Pond, but only reports of its occurrence in Wolf Pond and Rich Lake.

Before the drought of 1933 Little Sucker Brook, despite its small size, contained more trout per unit area than did the other streams. In fact, it had the distinction of being the only stream on the tract that was stocked to what may be considered full carrying capacity.

Even during the extremely low water level in August the trout of this brook, although somewhat diminished in numbers, were still thriving, albeit most of their numbers were landlocked in pools. Fortunately the small volume of water remained fresh and cool and, furthermore, other species of fishes were absent so that there was no

competition for the available food. The largest trout that I measured in this brook was only $6\frac{1}{2}$ inches long. Perhaps larger specimens escaped observation, but it is doubtful if any trout in this stream was of legal size.

Big Sucker Brook was the next stream of importance for trout in so far as actual numbers were concerned. It probably contained about as many individuals as the neighboring Little Sucker Brook, but being a longer and wider stream it obviously contained fewer fish per unit area. Practically all the trout here, also, were under legal size.

Corner Pond outlet, Wolf Creek, Panther Brook and Chase Brook each harbored a few trout. However, all of these streams, except Chase Brook, was badly affected by the drought, consequently the trout population during that time was unquestionably much smaller than during normal periods. Both Wolf Creek and Panther Brook had the necessary physical features indicative of good trout streams and with normal precipitation should contain sufficient water to harbor trout throughout the critical summer period.

A number of trout, three to four inches in length, taken from the mouth of Corner Pond outlet proved, upon examination, to be sexually mature fish (adults). One female, four inches in length, taken in late October, was nearly through spawning—three large eggs were taken from the ovaries and another was removed from the vent. Other females taken in December were spent fish. Stunted trout are quite common in the Adirondacks, particularly in the small streams and isolated ponds.

A $12\frac{1}{2}$ -inch female, found just outside the lily zone south of Birch Point, is the only record for Catlin Lake. This fish would have spawned the coming autumn. Catlin Lake undoubtedly contained more brook trout than was revealed by my seine and net collections. It is quite possible that the trout of the tributary streams become resident in the lake after attaining a certain size (approximately six inches, depending on the nature of the habitat) and, furthermore, that many of the stream-inhabiting trout take refuge in the lake when unfavorable conditions occur in their natural habitat. On the other hand, during the migratory movements of brook trout from middle October to well in November, it is expected that some of the resident trout of the lake ascend the adjacent streams to spawn. However, brook trout have been known to spawn on the gravelly shoals of certain Adirondack lakes, such as Cranberry, and it is, therefore, quite likely that it may find desirable areas in Catlin

Lake. Kendall and Dence ('27) in their studies on the trout of Cranberry Lake, found that the smaller tributary streams served as nursery waters and to a limited extent offered spawning facilities, but the lake itself harbored the large adults, some of which weighed two to four or more pounds. Perhaps similar conditions prevail in Catlin Lake, the streams in this case also serving a double purpose—as nursery waters and spawning areas.

Wolf Pond is a likely habitat for brook trout, but I have no actual records for it. I have been told that fishermen occasionally poach in this pond in winter as well as in summer and it seems rather improbable that they would seek such remote waters to obtain fish other than the highly prized brook trout unless lake trout should by chance be present. My own efforts in this pond with nets and fishing tackle resulted only in catches of sunfish, exclusive of the non-game species.

The predacious and cannibalistic habits of the brook trout are generally known, but it seems worth while to mention here the case of a 4½-inch specimen taken from Corner Pond outlet in February, which contained a partially digested brook trout three inches in length. I suspect that a good many trout disappeared in like manner during the drought of last summer. Close confinement in pools and scarcity of invertebrates and minnows would certainly encourage the cannibalistic habit.

Common Sucker (*Catostomus commersonnii commersonnii*)

The common sucker occurs in all the lakes and ponds of the tract and I believe that it is common and perhaps even abundant, at least in some of them. Gill nets set at various places and depths in these waters seldom failed to capture suckers except in the very deepest parts of Catlin and Rich lakes. It would appear from my experiments that the suckers confine themselves to areas less than forty to forty-five feet in depth.

Spawning fish are said to ascend certain streams in great numbers during the early part of May. Such a migration was noted by Mr. McCoy in 1934 in a tributary of Rich Lake within the Arbutus Preserve. That this fish spawns earlier than the closely related dwarf sucker (*Catostomus commersonnii utawana*) is borne out by the fact that all of the specimens taken in early June were spent fish while the dwarfs were at the peak of their spawning.

The species appears to be more abundant in Deer Pond than elsewhere. This lake is fairly shallow (maximum depth ten feet), weedy and contains considerable muddy bottom—features that are

very favorable to suckers. A good many sucker fry were taken in the shallow muddy sloughs at both the inlet and the outlet, particularly the former. The beaver flooded area at the head of Deer Pond seemed to provide an especially favorable habitat for these young suckers and their abundance is indicated by the fact that eighty-nine specimens were collected in three or four dips with the 6-foot minnow seine. Immature suckers also were collected about the shores of the other lakes and ponds with a small minnow seine, but large schools were never encountered in such places.

The streams were uninhabited with suckers after the close of the breeding season, except at the very mouth where there was little or no current and the water was somewhat warmer than farther upstream. The common sucker is by no means a stream fish on the tract.

The suckers caught in the gill nets were quite uniformly twelve to fifteen inches in total length regardless of the depth of water or type of habitat from which they were taken. This would appear to represent a considerable amount of food for human consumption but the species is seldom utilized for that purpose in this region. It does, however, provide an excellent supply of food for predatory fish, birds and mammals. Since the lake trout of Catlin and Rich lakes inhabit very deep water most of the time, it is somewhat questionable whether young suckers provide an important food resource for them. Stimulated by hunger they may forage in sucker-inhabited territory particularly at night.

Dwarf Common Sucker (*Catostomus commersonnii utawana*)

This dwarf form of the common sucker was first observed on the spawning beds in the lower portion of Big Sucker Brook on June 5 and 7, 1933. It was neither seen nor collected on the two preceding or the two following days, consequently I was unable to determine whether this was the beginning or the end of the spawning activities, especially since not over a dozen individuals were seen. On June 7th of the following year only one pair was observed in this brook.

The greatest number of dwarf suckers was found in the two inlets of Wolf Pond. The outlet of this pond, only a few rods from the north inlet, was not used by the spawning suckers, yet thousands of large common shiners were breeding there at the peak of the sucker spawning season. While the suckers may have reacted to stimuli resulting from the incoming current other factors undoubtedly had some influence upon the choosing of the spawning habitat.

Another group of suckers was found in the lower part of Deer Creek, an inlet of Catlin Lake. These fish, as well as those of Big Sucker Brook, were slightly larger than those of the Wolf Pond tributaries and yet they were much smaller than the normal common suckers of the region. Common shiners, horned dace, long-nosed dace and cut-lips were also on the spawning grounds with the Deer Creek suckers.

Dwarf suckers will wriggle over shallow riffles where there is scarcely enough water to cover their backs, but they cannot or will not surmount a waterfall a foot or so in height. Therefore, in the small streams one never finds this fish beyond the low and more or less level stretches occurring at the mouths of the streams. The north inlet of Wolf Pond contained a longer stretch of suitable spawning area than the other streams mentioned above, consequently more suckers occurred there than elsewhere.

Favorite spawning places occur in shallow pools at the foot of riffles where the bottom is composed of sand and gravel. Spawning was observed rather frequently in water so shallow that the breeding fish were only partially covered. Thus it was not always necessary to have a net in making collections as greater success frequently could be had with the bare hands. When undisturbed and when not actually taking part in spawning activities dwarf suckers usually rest on the shallow riffles. Sometimes a large group of them may be seen rather close together all headed upstream and scarcely moving a fin. A slight disturbance and all will scatter for deeper water or any other shelter that may be available.

Normally a spawning group consists of two males and one female, but not infrequently other males will crowd in and during the spawning act take a position above the others if the water is of sufficient depth. Spawning occurs at all times of the day, but is more in evidence at night. The sexes were easily distinguishable because the females were not only a trifle larger but in addition were much paler. The males greatly outnumber the females, but since the matings ~~was~~ ^{are} more or less promiscuous, each fish undoubtedly has a part in the spawning activity. Male suckers do not assume a belligerent attitude toward other males during the spawning procedure as do certain cyprinids and trout, for example, but devote all their efforts in the scramble to reach the females.

The temperature of water at the various spawning areas ranged from 59°F. to 67°F. The south inlet of Wolf Pond contained the coldest water and the north inlet the warmest. These temperatures

at Wolf Pond were recorded during an unusually warm period. Concurrent with the difference in temperature of the two inlets of Wolf Pond was a corresponding difference in length of spawning season. Thus a considerable number of suckers in the south inlet were actively spawning on June 9th while all of those in the north inlet had completed this function and had deserted the area.

As stated earlier in this report, dwarf suckers suffer considerable loss of numbers from predatory animals while on their spawning grounds. At Wolf Pond usually only the heads of the victims remained as evidence, although an occasional dead fish was found that had not been eaten.

Long-nosed Dace (*Rhinichthys cataractae*)

This species appears to be very scarce on the tract due largely to the absence of suitable habitat. It is partial to riffles with fairly rapid water. Eight specimens taken near the mouth of Deer Creek on June 6, 1934, represent the only actual records for the tract. These were associated with breeding common shiners and dwarf suckers on the rapids in fairly deep water. A small tributary of Long Pond just beyond the boundary of the property yielded two specimens in August, 1933.

The long-nosed dace is really so scarce that it has a very insignificant place in the biota of the tract. Perhaps it repairs to Catlin Lake after the breeding season, otherwise it would have been represented in the collections made in Deer Creek in August, 1933.

Black-nosed Dace (*Rhinichthys atronasus*)

Big Sucker Brook, Corner Pond outlet and Round Pond outlet are the most important black-nosed dace streams on the tract. The species was more evenly distributed and more abundant, by far, in the first-named stream than it was in any of the others. However, this applies only to the lower half of Big Sucker Brook, for all species of fish except brook trout were absent in the section above the beaver meadow.

This dace apparently does not occur in Little Sucker Brook, for it was neither seen nor collected there during my various visits. The fact that Big Sucker Brook, located only a short distance to the west, was so abundantly populated leaves me somewhat at a loss to account for its absence in Little Sucker Brook, particularly since the two streams are quite similar in character. Panther Brook was also

uninhabited with this fish at the time of my visit there in August, but that was to be expected because the conditions in the stream at that time were not particularly conducive to the welfare of any fish.

While the black-nosed dace frequently occurs in lakes and ponds in the Adirondacks, it is more typical of streams. It is not surprising then that only a few specimens were found in the following ponds: Wolf Pond, Deer Pond and Corner Pond.

This dace is partial to fairly small streams and especially those with shallow pools interspersed with gravelly riffles. During early June, I found a good many highly colored specimens on the gravel riffles of Big Sucker Brook. While actual spawning performances were not seen the males of certain small groups were in courtship. These groups were constantly on the move. Horned dace and an occasional brook trout were associated with the dace in the pools, but these were usually in the minority. The bright colors characteristic of breeding individuals were not in evidence by August and the fish were leading a sedentary life.

Horned Dace (*Semotilus atromaculatus*)

The horned dace is probably the most generally distributed species of fish in the entire tract. It occurs in the lakes and ponds as well as in the streams. Little Sucker Brook is the only stream that did not contain at least a few specimens.

It was particularly common in certain parts of Big Sucker Brook. Here it was associated with pearl minnows, black-nosed dace and, to a lesser extent, brook trout. Many of the females secured here during early June were gravid and would have spawned in a short time. Furthermore, well developed pearl organs were found on a few large males. On June 4, 1934, big schools of large breeding horned dace were noted in the outlet of the large artificial lake, on the Arbutus Preserve, which empties into Rich Lake. The dam at the outlet of this lake was the cause of this great concentration of numbers; the fish had ascended the stream as far as possible.

This dace has no great economic importance other than to provide food for certain predacious game fish. In the trout streams it often competes so strongly for the available invertebrate animal life as to render it an undesirable inhabitant. While it provides food for trout to a certain extent, this is oftentimes offset by the damage it may do in eating trout fry.

Pearl Minnow (*Margariscus margarita*)

This minnow was taken in only one stream on the tract, Big Sucker Brook. However, three specimens were collected in a small tributary of Long Pond, just a few rods beyond the boundary of the tract. It is therefore quite likely that the species inhabits Catlin Lake or its tributaries.

In Big Sucker Brook the species was limited to the section flowing through the beaver meadow (Fig. 309), mentioned elsewhere in this report. In early June, 1933, a deep pool at the very upper edge of the beaver meadow contained a good many pearl minnows in association with horned dace and brook trout. Pearl minnows as well as other species of fish, except trout, were not found above this pool. On August 5th of the same year the stream was entirely dry throughout most of the meadow; the only available water was in the pool at the upper end and the pond back of the beaver dam at the foot of this meadow. This minnow occurred in both places, but its numbers had been greatly reduced since my earlier visits. Perhaps many of them had descended to Rich Lake, about a mile distant. Others undoubtedly had been trapped in pools throughout the meadow that later became dry. Then too, predatory mammals and birds probably consumed a good many.

Upon opening a number of specimens collected in June, I found that they were spent fish. However, the high coloration characteristic of breeding males was still in evidence. Evidently this species breeds early.

Pearl minnows have no economic value other than to provide food for game fish and especially brook trout.

Red-bellied Dace (*Chrosomus erythrogaster*)

The red-bellied dace was not taken in any of the lakes and ponds of the tract, except Wolf Pond, and it has a very limited distribution in the streams. It is not particularly common anywhere. The greatest number was found in the swamp area above Deer Pond, flooded by a recently constructed beaver dam. Thirteen specimens were collected here with a six-foot minnow seine. In Wolf Pond it was taken near shore at the southern end on baited ground.

This fish is quite partial to sluggish streams. However, the streams on this tract are, for the most part, rather steep except for a limited portion at their mouths. All of my stream collections of this minnow were from the deeper pools located at the more level



Fig. 305. Big Sucker Brook. Scene well upstream. June 6, 1933.



Fig. 306. View in lower section of Big Sucker Brook. The large partially decayed log formed an excellent retreat for several trout before the brook became so low. August 6, 1933.



Fig. 307. Looking across the outlet of Rich Lake towards Pickerel Channel from Cold River trail. White water-lilies in bloom in bay. Goodenow Mountain in distance. August 6, 1933.



Fig. 308. View of outlet of Rich Lake and island (peninsula at low water stage), opposite mouth of Big Sucker Brook. June 3, 1933.

stretches. In addition to those taken in Wolf Pond and Deer Pond beaver flow, collections were made in Wolf Creek, Corner Pond outlet and a small tributary of Long Pond.

The apparent scarcity of this minnow in the lakes and ponds may be due to the heavy inroads made upon it by various predacious fish. Brook trout are especially fond of it, judging from the results of stomach examinations of specimens taken in various parts of the Adirondacks, particularly Cat Mountain Pond of the Cranberry Lake region.

This minnow has no particular economic value except as food for other fishes.

Black-nosed Minnow (*Notropis heterolepis*)

Abundant in Rich Lake and common in Deer and Long ponds. Not found in the other waters of the tract although I believe it must occur in Catlin Lake, because this body of water is connected with Long Pond by a small channel known as "Sabattis Pass."

The species is particularly partial to shallow, weedy, slough-like areas of lakes and ponds and especially those along the shore and at the mouths of small tributary streams. A small lagoon at the mouth of the outlet of Lake Lodo, which enters Rich Lake at Maderia Bay, contained a large school of these minnows in early June. Many more were seen about the mouths of the two small tributaries immediately west of this lagoon. The north shore of Rich Lake in the region of the two Sucker brooks was also abundantly populated with the black-nosed minnow.

This minnow was very abundant in the shallow water at the outlet of Deer Pond. The bottom of the pond as well as the brook at this place contained a deep deposit of silt and sand. The immediate shore area at this point was a bog with typical bog plants such as sphagnum moss, pitcher plant, cranberry, leather leaf, Labrador tea, and sweet gale. Bladderwort, algae and tufts of deer grass were the principal emergent plants occurring in the black-nosed minnow habitat.

This is another minnow that has no economic importance except to be utilized by other fish as food.

Common Shiner (*Notropis cornutus*)

This minnow is rarely found in the streams of the tract except during the breeding season, but it is quite generally distributed in the lakes and ponds. The outlet of Round Pond was the only stream

that contained suitable habitat for it; the others were too rapid and more of the type adapted to brook trout.

In 1933 Big Sucker and Little Sucker brooks were visited at various times during the first week of June when this minnow would ordinarily leave Rich Lake for its spawning grounds, but there were no signs of it there. Perhaps these streams do not offer suitable spawning areas and the fish utilize the shoal waters of Rich Lake instead. However, the common shiner appears to be abundant in Rich Lake because I have seen a considerable number of adults near the dam and at various other places along shore, particularly about the island opposite Big Sucker Brook. Some of these were males in breeding colors. Specimens ranging from $1\frac{3}{4}$ to 3 inches in length were found in association with golden shiners, black-nosed minnows and sunfish at the mouth of Big Sucker and Little Sucker brooks, as well as along the adjacent low shore areas.

A good many small shiners were taken at both ends of Wolf Pond during the summer of 1933. However, no adults were found in this pond until early June of the following year when quantities of them were observed on their spawning grounds in the outlet (Wolf Creek, Fig. 303). The brilliantly-colored males dashing in and out among the rock crevices, in their efforts to corral the females or chase away rivals, produced a very impressive scene. Spawning appeared to be taking place under the shelter of boulders, judging from the behavior of the males. By June 7th, the spawning fish had returned to the pond. The two principal inlet streams of Wolf Pond were not frequented with spawning shiners.

Another group of spawning shiners was observed a short distance above Catlin Lake, in Deer Creek. While this species occurs in both Deer Pond and Catlin Lake, there is no question but that these spawning fish originated in Catlin Lake. This indicates that the species will enter inlet as well as outlet streams to spawn.

After the spawning season, adult common shiners repair to deep water where they are seldom seen, although a small worm-baited hook will sometimes serve as an effective collecting device. Immature shiners are quite generally distributed in shallow water, particularly in such weedy habitats as occur in Long Pond, where nearly every haul of the 6-foot minnow seine yielded at least a few specimens. It is very difficult to determine the status of common shiners in such bodies of water as Catlin Lake, because even the young are not commonly found in the shallow areas about the shore. However, it would appear that the species is not abundant, as was reported by

Odell ('33, p. 128), otherwise greater numbers would have been seen on the spawning grounds.

This is a very good forage fish for the game species and its apparent scarcity in certain waters of the tract may be attributed to this cause.

Golden Shiner (*Notemigonus crysoleucas*)

Rich Lake unquestionably contained a greater abundance of golden shiners than any other body of water on the tract. This shiner was especially common at the eastern end of the lake and particularly in the small bayous where there was considerable vegetation. On several occasions I saw large schools of them near shore, but they hastily retreated to deeper water when disturbed. These fish were quite uniform in size—between two and three inches in length. Graveyard Bay, both ends of Pickerel Channel and the region about the mouth of Big Sucker and Little Sucker brooks were some of the most important habitats during early June.

The species was also abundant in Deer and Long ponds. Both of these ponds were fairly shallow and contained considerable vegetation such as pond lilies and various species of *potamogeton*. While the other ponds, as well as Catlin Lake, were inhabited by the species I believe that it was not particularly common in any of them. The deeper waters contain too little vegetation to attract golden shiners.

The golden shiner has but little economic importance aside from serving as food for game fish. The great northern pike of Rich Lake inhabits the same weedy areas as the golden shiner and naturally avails itself of this abundant food supply. Yellow perch, brook and lake trout and even the bullhead live largely on a fish diet in the waters of the tract and consequently they would be expected to take many golden shiners.

The adults seem to be partial to the weedy areas beyond the shallow shore areas where the depth is five or more feet. At least they were never seen in shallow water where the young commonly abound.

Cut-lips Minnow (*Exoglossum maxillingua*)

On June 4th, I captured four large breeding cut-lips and saw a good many more in Rich Lake just off the point to the west of Graveyard Bay. The bottom of the lake where the fish were observed was composed of gravel and sand, principally the former. Preparation of nests was in progress, therefore the participants were quite reluctant to leave, even at the near approach of my net. They returned almost

immediately to the nests when driven away. The captured fish were very dark colored. A number of red-bellied sunfish were in association with these cut-lips.

Other specimens were taken from Wolf Pond, Belden Lake, Corner Pond outlet and Round Pond outlet. The last named stream was abundantly stocked with them. A partly digested cut-lips was removed from the stomach of a large bullhead taken in about fifteen feet of water at the north end of Catlin Lake. Two other specimens were gathered from the surface of this lake after a charge of dynamite had been exploded at Sabattis Pass in an attempt to deepen the channel.

Eight other specimens were collected on their spawning beds at the lower end of Deer Creek on June 6, 1934. These were in association with long-nosed dace, common shiners and dwarf suckers.

The status of the cut-lips minnow in Catlin Lake is, however, rather uncertain but I would expect it to be present in goodly numbers. If such is the case it will provide a valuable food supply for certain game fishes such as yellow perch, brook and lake trout.

Common bullhead (*Ameiurus nebulosus*)

The common bullhead occurs in nearly all, if not all, of the lakes and ponds on the tract. It is particularly common in Rich Lake where it is frequently taken with hook and line in early summer. During the first week of June, 1933, anglers frequented the lake about every night despite the annoyance of mosquitoes, black flies and punkies which were very troublesome at that season of the year. The bullheads taken in this manner averaged between 6 and 7 inches in total length which appears to be the average length of adults for the entire tract. This average is somewhat smaller than for that of bullheads farther down State, where the waters maintain higher temperatures.

The masses of large bowlders occurring along and in the channel of Rich Lake outlet provide desirable cover for spawning purposes and many bullheads were routed from such places in early June during two successive years. No bullheads, either adults or young, were seen on August 4th.

The bullhead seems to be quite rare in Catlin Lake, my only record being a 7-inch specimen which was taken in a gill-net at the northern end of the lake in about fifteen feet of water. This fish contained a partly digested cut-lips minnow. It did not frequent the shallow water during the month of August. Mr. Oja says that he has seen

the adults accompanied by large schools of young in shallow water in late June and early July.

A number of bullheads have been taken from Deer Pond during the winter. This indicates that the species is fairly common there. The muddy shallow water in the bay at the mouth of the inlet seemed to have a special appeal for this fish as well as for sunfish, horned dace and other minnows, and I observed a good many here during the month of August. At this place I observed an adult bullhead ascend to the surface and grab an unusually large dragonfly that was struggling to take wing. The fish had some difficulty in submerging with its prey, but it was finally successful. In June, 1934, I noted many adults along the shore in the southern part of Deer Pond. They sought concealment under old logs or under small floating bogs and overhanging banks. These were probably nesting fish.

I have no records for Wolf Pond or Corner Pond.

Great Northern Pike (*Esox lucius*)

The great northern pike is not indigenous to Adirondack waters and its introduction in Rich Lake, the only body of water on the tract inhabited by it, undoubtedly occurred about three-quarters of a century ago at the time when several other eastern Adirondack lakes and ponds were being stocked with Lake Champlain and Schroon Lake pike. According to Mather (1890, pp. 133-135) the firm white flesh and excellent flavor of the pike were responsible for its popularity. In certain waters, at least, the pike supplanted the native trout which was said to have been "fished out."

There is no evidence to support the theory that the pike migrates to Long Pond and Catlin Lake via Fishing Brook. However, it has been reported as spawning near the mouth of Fishing Brook.

Sportsmen come from far and near in summer and in winter to fish for pike in Rich Lake, but there are never any great number there at any one time. During August of 1933, I met fishermen from Albany, Glens Falls and Indian Lake, all of whom made fairly good catches.

On August 22, 1934, a party of two men from Albany and Schenectady caught 12 large pike in about eight hours' time. They stated that a number of other small pike, though of legal size, were returned to the lake. In the early winter a considerable number were reported taken through the ice on hook and line. Trolling or plug casting are the methods used in catching pike during the summer.

Despite the considerable numbers removed annually, the supply appears to be constant and this indicates successful spawning. However, no young pike were seined from shallow water during the course of my field work.

While the lake as a whole is not particularly ideal as a pike habitat, there is an abundant supply of food in the form of yellow perch, golden shiners, sunfish and other species.

Most of the fishing for pike occurs along the north shore of Graveyard Bay, in the region of Birch Point (also on the north shore) and the south shore of the outlet as far downstream as Pickerel Channel (Fig. 307). The lily pad areas are particularly good hangouts for this game species.

Yellow Perch (*Perca flavescens*)

All of the ponds and lakes of the tract with the possible exception of Wolf Pond are inhabited with yellow perch. It is very abundant in Rich Lake and Deer Pond, but its status in the other ponds was not determined because it was frequenting the deeper waters at the time of my visits. However, I believe that the species is also common in Catlin Lake, judging solely from the numbers caught in the gill-nets.

The perch of Catlin Lake were very large (Fig. 312). The 44 caught in the nets ranged from 11-14¼ inches in length—all females. Scale readings from a few of these specimens indicated that the ages varied from 6 to 9 years. A few smaller fish (5-6 inches) were caught on hook and line, but were released. Although I have frequently looked for schools of young perch in shallow water at various points about the lake, none has been seen. But this is not strange as most of the fish in the lake seldom appear within the five-to six-foot contour where there is a definite zone of aquatic plants such as water lilies and potamogetons. The scarcity of young perch is probably due to the predacious habit of their parents. This is borne out by the fact that some of the captured adults contained perch in their stomachs. A number of perch taken from Deer Pond through the ice averaged around 6 inches in length. This seems to be a true average for the pond as a whole.

Yellow perch are not native to any of the waters of the tract, but there are no available records as to when or why they were introduced. In any event, it was a great mistake because it is supplanting fish of greater economic and æsthetic importance.

Common Sunfish (*Eupomotis gibbosus*)

Two species of sunfish inhabit the waters of the tract—the common sunfish (*Eupomotis gibbosus*) and the red-bellied sunfish (*Lepomis auritus*). In certain waters the common sunfish far outnumbers the red-bellied species, while in others it is unquestionably in the minority.

Breeding sunfish were much in evidence in Rich Lake in early June, particularly at the eastern end in the vicinity of the island and peninsula in Graveyard Bay. Both species were present, but judging from collections and direct observations, the common sunfish outnumbered the other species about 6 to 1.

The nests were well in toward shore on gravel bottom, many of them being in water less than a foot in depth. Favorite nesting sites occurred at the various rocky points, where the disintegrated granite rocks provided desirable gravel beds for the nesting fish. Some of the nests were only a few inches apart. Frequently both species were observed on the same spawning area and they seemed to be very congenial, at least I observed no combats among the guarding fish. In the deeper waters, obviously, it was quite difficult to distinguish the species, consequently my determinations pertain to those in shallow water only.

Many small sunfish were found in and about the sloughs in association with small golden shiners, black-nosed minnows and common shiners. Here again the common species predominated.

In Belden Lake, I counted fifteen nests on the small sandy bar in front of the little island near the dam. On June 7th each of these nests was attended by an adult fish. The nests were scarcely six inches apart. Rock bass were nesting only a few feet from this sunfish nesting area, but had chosen more of a muddy type of bottom with leaves, sticks and other debris in mixture.

Adult common sunfish were taken in Deer Pond on hook and line. Many immature fish of this species were also seen at various places about the shore. This species was more abundant here than the other form.

I caught many adult red-bellied sunfish with a hook and line and smaller ones in shallow water, with a seine in Corner Pond and Wolf Pond; but the common sunfish was either scarce or perhaps absent altogether in these ponds.

One large common sunfish was taken in Catlin Bay of Catlin Lake. The majority of small sunfish noted in shallow water, however, was of the red-bellied species.

The common sunfish is a very good pan-fish and yet it is not extensively utilized in this region, because the larger and more desirable brook trout, pike and bass are fairly accessible. The task to prepare sunfish for the table is not an easy one and the job becomes more irksome when their numbers run consistently small as they do in this region. The species is really stunted in size as compared with those of other waters outside of the Adirondacks.

Red-bellied Sunfish (*Lepomis auritus*)

As mentioned above this sunfish and the common species occurred in certain waters of the tract in association; and since they resembled each other so closely in shape when seen at a distance under water, it was sometimes quite difficult to distinguish between them. However, during early June, both species were nesting in shallow water and it was then possible to get close enough to make specific determination. Later in the season, the relative abundance of the two species was ascertained largely by collecting specimens, both adults and young.

In general the species was limited to the lakes and ponds, but a few were taken near the mouths of certain streams. In the case of Round Pond outlet, however, red-bellied sunfish were found in the deeper pools several rods below the pond itself. Also a few small ones were found near the Catlin Lake end of the stream. Thus the sunfish in this stream undoubtedly represent individuals both from Round Pond and Catlin Lake. Natural barriers preclude the possibility of the two groups becoming mixed.

A good many specimens were caught with a hook and line in Corner Pond and Wolf Pond. Earthworms and small grasshoppers were used for bait and were eagerly taken. The common sunfish, however, was never taken in this manner. Hence, it is either scarce or else it does not bite as readily as its relative.

Red-bellied sunfish were fairly common in Rich Lake and frequently occurred in association with the more abundant common species. In Catlin Lake this sunfish was more plentiful than the other species, but there was little evidence of its being common there, as has been reported by others (Odell, '33).

As in the case of the common sunfish, this species is a very good pan-fish, but due to its stunted condition, it is rather infrequently used for that purpose in the Adirondacks. No one cares to catch and prepare sunfish for the frying pan when larger or more desirable

fish are available. Young sunfish, especially, provide food for predatory game fish and may thus be converted into flesh of greater economic importance to man.

Rock Bass (*Ambloplites rupestris*)

Recorded only from Belden Lake. It is apparent that this species does not get above the dam at the outlet of Rich Lake. Only adult spawning fish were found.

On June 5th, several pairs were found spawning at the upper end of the lake. The nests consisted of hollowed or cleaned places about a foot in diameter well inshore in 12 to 15 inches of quiet water. The bottom consisted of sand but many fine rootlets had been exposed by the males while sweeping the nest areas and the eggs were adhering to these or to small pieces of bark and wood.

The males were very busy individuals, for when they were not chasing intruding sunfish and minnows that persisted in reaching the nests, they were circling about the females to keep them on the nests. On June 5th actual spawning was taking place on some of the nests.

When I visited the spawning grounds late on the afternoon of June 7th, I found the males guarding the nests but the females were not present. Evidently the actual spawning function had been completed.

This species is sometimes caught by vacationists and amateur fishermen such as children, who, for want of boat facilities, apply their art from shore, particularly at the base of the dam at Belden Lake. There is very little value attached to the species as a food source.

Northern Sculpin (*Cottus cognatus*)

Mr. O. W. Oja, Chief Ranger of the Huntington Forest, obtained four specimens of this sculpin at the mouth of Corner Pond outlet in February, 1933. During my field studies on Wolf Pond in June, 1934, I took two sculpins from the spawning bed of dwarf suckers on the north inlet and another specimen from a similar area on the south inlet. While these are the only records for the tract, I feel certain that the species occurs in Catlin Lake and perhaps in certain of the other waters. However, the intensive seining of the brooks during the extremely low water levels in August did not yield any sculpins. Neither did the shallower portions of the lakes and ponds.

The smaller fish inhabitants of the deeper waters are still unknown and it is quite probable that the sculpins of this area may frequent such habitats during the summer months. The fact that specimens were found so near Catlin Lake and Wolf Pond is rather significant in this respect.

The specimens in the collection measured $2\frac{5}{8}$ – $3\frac{3}{8}$ inches in length.

THE LAKES AND PONDS OF THE FOREST

Corner Pond. Corner Pond lies in the extreme northwest corner of the tract, fully two-thirds of its area being outside the boundary. The area within the boundary consists of approximately 20 to 25 acres. This pond has an elevation of 1720 feet, which is 123 feet higher than Catlin Lake into which it drains.

For a small body of water, Corner Pond is surprisingly deep. On August 19th, it had a maximum depth of 23 feet, in about the center. The maximum depth of the portion belonging to the tract was 21 feet. At a point about 50 feet north of the outlet it was 10 feet deep. Northward from here there was a gradual increase in depth up to about 14 feet, then the bottom pitched rather sharply until the water reached the maximum depth. In other words, there was a relatively small area in the center of the pond that maintained a depth of 20 feet or over and, furthermore, a greater depth was maintained toward the eastern portion of the pond than elsewhere.

The pond lies at the foot of Kempshall Mountain (3360 feet, elevation) from which it receives the bulk of its water. There is enough bog area about the inlet streams to impart a brownish color to the pond water. The temperature of the surface water during August was 70°F. Much lower temperatures undoubtedly prevailed at the bottom of the deeper portion as to be well under the maximum temperature necessary for the welfare of brook trout.

Water lilies and pipewort were the most conspicuous aquatic plants in the pond. The former occurred in a more or less definite zone at a depth of approximately five feet; the pipewort grew between that zone and the shore, where the bottom was composed of sand. The submerged and partially decayed logs, sticks and brush were of frequent occurrence in the shallow water. Some were remnants of beaver activity ten or twelve years ago.

The bottom consisted for the most part of sand which was overlaid with silt, particularly at the outlet and in the small bayous. Huge

boulders and outcrops of granite rock occurred in the region of the island (peninsula on topographic map).

In the shallower parts the red-bellied sunfish were abundant; and yellow perch, horned dace, golden shiners and suckers were common. Brook trout are said to inhabit the deeper parts in considerable numbers, but I have only one small specimen that was caught on a hook and line. The pond appears to be quite desirable for trout; however, I suspect that there is strong competition for the limited amount of invertebrate animals. The sunfish, perch and horned dace, especially the first-named, were very hungry and eagerly took a worm-baited hook.

Catlin Lake. Catlin Lake is $2\frac{3}{4}$ miles long and has a maximum width of approximately three-quarters of a mile—a total area of 531 acres. It cuts diagonally across the northwest corner of the tract between Kempshall and Pickwacket mountains on the west, Panther, Catlin and other smaller mountains on the east. This is the largest body of water on the tract, but it is not quite as deep as Rich Lake, the deepest body of water on the tract.

Corner, Round, Deer and Wolf ponds drain into Catlin Lake, and additional water is supplied by several small tributaries of spring origin, the largest and most important being Chase Brook. During the latter part of August, 1933, when the lake was at its lowest level, cold water ($58^{\circ}\text{F}.$) was found bubbling from the ground at various places along the beach, particularly in the vicinity of the Dougherty trail on the eastern shore near the north end. Since these bubbling springs were still producing considerable water despite the unusually dry period, one can readily appreciate the greater volume that would be delivered to the lake in normal periods. Likewise we can only speculate as to the total number of springs present on the bottom of the lake and the volume of water delivered to it. However, if there are any great number, the temperature of the water might be reduced sufficiently to make for better trout habitat. The large lake trout that are occasionally observed in the lake, no doubt, find these spring areas to their liking.

The temperature of the surface water during August varied from 70° to $72^{\circ}\text{F}.$ The region of the hypolimnion, and perhaps the thermocline as well, should, therefore, be cold enough for the welfare of trout during the most critical summer period.

A good many soundings were made and the deepest part of the lake was found to be that portion between headquarters and Club-

point. Soundings expressed in feet, at approximately 50-foot intervals, in a straight line from a point a few yards south of Chase Brook on the west side to a point about 200 feet south of Birch Point on the east side were as follows: 5, 12, 26, 27, 30, 36, 39, 42, 46.5, 46.5, 48, 45, 48, 48, 45, 44, 41, 39, 39, 36, 33, 21, 11, 10 (100 feet offshore). The maximum depth encountered in a straight line between Club-point and the mouth of Deer Creek was 42 feet. However, a depth of 43.5 feet was recorded some distance south of here. Shallower water prevailed at the upper (north) end of the lake, the maximum depth opposite camp headquarters being only 33 feet. A quarter of a mile north of here it was only 17 feet. The deepest place in the narrows at the upper end of the lake was 15 feet. Above this point a depth of 10 to 11 feet was recorded in many places, but the water was considerably shallower than this in the last two or three hundred feet of linear extent at the upper end.

Two species of trout are known to occur in Catlin Lake—lake trout and brook trout. The rainbow trout has been reported as being "rare" but its presence is very doubtful. While the Conservation Department in its survey for the year 1932 recommended the stocking of certain tributary streams of Catlin Lake with rainbow trout, I believe there is nothing to be gained in so doing, because these streams are capable of supporting the native trout, which are considered more desirable than the exotic species. Rainbow trout planted in the tributary streams would eventually enter the lake and thus compete with the lake and brook trout already established there.

Adult lake trout have been found at various times and places about the lake, and the records thus accumulated are quite sufficient to warrant the listing of the species as fairly common. The greatest number was seen on the evening of October 17th in shallow water near the outlet of Corner Pond. Mr. Oja, Chief Ranger of the tract, stated that he saw many very large individuals at that time. His description of these fish, together with the account of their activities within the area, indicates that these were spawning lake trout. Two lake trout more than two feet in length were observed near the rocky shore north of Catlin Bay in the early spring of 1933. A large dead specimen was found at the north end of the lake during the fall of 1932 and another dead, but very fresh specimen, was found near headquarters on August 19, 1933. The last named specimen weighed $6\frac{3}{4}$ pounds and measured 27 inches in length. No abnormal pathological condition or injury as regards this fish was observed, therefore, the cause of death is unknown. It was a male with large and



Fig. 309. Typical scene on Big Sucker Brook near upper end of beaver meadow. Many *Margariscus margarita* found here. June 7, 1934.



Fig. 310. Looking across the beaver pond and meadow from the old and abandoned beaver dam on Big Sucker Brook. August 6, 1933.



Fig. 311. Catlin Lake beach at low water stage. View south from mouth of Corner Pond outlet. August 12, 1933

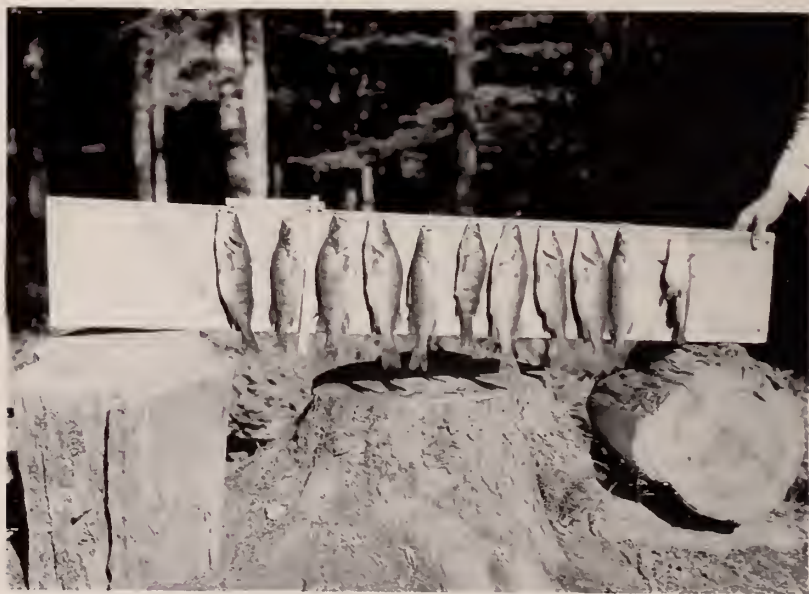


Fig. 312. Large yellow perch and a common bullhead from Catlin Lake. The sizes shown here are typical for the lake. August 9, 1933.

well developed spermaries. The lake has not been stocked in recent years, consequently the lake trout population is now maintained by natural reproduction.

The status of brook trout in this lake is still a mystery. A 12½-inch female approaching spawning condition became entangled in the meshes of the gill net which was set in Catlin Bay on August 18th. While this is my only record for the lake I believe that a considerable number occurs there and that the tributary streams function as nurseries. This theory is substantiated in part by the fact that the majority of the stream-inhabiting trout disappeared during the unusually dry periods of the 1933 and 1934 summers, and it is logical to assume that at least a part of them retreated to the lake. Then, too, the very fact that one healthy specimen inhabited the lake indicates that others may be present, especially since favorable habitat is available.

The introduced yellow perch is probably the most abundant game fish in the lake, but its numbers are held in check by the trout as well as by the perch themselves. The large perch taken in the gill nets had lived almost exclusively on a diet of yellow perch. Were it not for this predacious habit of the perch, the lake would undoubtedly be teeming with stunted individuals because it is a prolific breeder. All of the perch taken in the gill net were females, ranging from 11 to 14½ inches in length. A few smaller ones were caught in shallow water on a hook and line.

In addition to the game fish mentioned above, the following species were taken from the lake: common bullhead, common sucker, common sunfish, red-bellied sunfish, cut-lips minnow, horned dace, golden shiner and common shiner. In general these non-game species have little value other than to provide food for the game species.

Deer Pond. Deer Pond is approximately three-quarters of a mile long and one-quarter of a mile wide, making a total area of about 120 acres. It is nearly a hundred feet higher than Catlin Lake, into which it empties through Deer Creek. Deer Creek is the only inlet of any consequence. This stream takes its source beyond the eastern boundary of the property and enters the pond at its southeast corner. An old beaver pond (originally a small swamp) occurs about three-quarters of a mile above Deer Pond and for convenience this has been called "Little Deer Pond."

The southern shore of Deer Pond was quite boggy, particularly at the southwestern corner, in the vicinity of the outlet. Such bog

plants as sphagnum moss, cranberry, pitcher plant, Labrador tea, leather leaf, sweet gale, spiraea, etc., abound in a more or less wide zone near the pond, while beyond this there is a stand of tamarack, black spruce, balsam and red maple. The marginal areas at other points were fairly high and rocky with varying widths of sand beach, depending on the amount of precipitation.

The original forest on the northern and eastern sides of the pond was destroyed by fire several years ago, but has been replaced by a new stand composed of aspen, yellow birch, fire cherry and with a fringe of alder at the high-water margin of the pond. The run-off must have been greatly affected immediately following the fire and throughout the subsequent changes in vegetation and this in turn probably materially affected the pond. Even today forest conditions do not simulate those previous to the fire. This has a direct bearing on the pond as a fish habitat.

Deer Pond is surprisingly shallow compared with the other bodies of water on the tract. While a maximum depth of ten feet was recorded in several places, much of the pond is considerably shallower. The bay at the southwest corner has a maximum depth of four feet, but fully two-thirds of it is less than two feet in depth. The channel between the island and the point on the west mainland has a maximum depth of only eight feet.

The bottom at the southern end is composed of loose silt-like sand, in mixture with decayed vegetation, to a depth of three to four inches or even more near the shore. However, a firmer bottom of sand, gravel or bowlders occurred at the upper part of the pond at certain points about the shore. Rock surfaces occurred.

Deer grass (*Eriocaulon septangulare*) was the principal plant growing in the shallow water. Beyond this at a depth of about five feet there was a distinct zone of yellow water lilies. Deer were feeding on both of these plants during mid-August. Large masses of algae and bladderwort were found in the shallow water of the bay near the outlet. These plants evidently had been driven from deep water by wave action. In addition to the above plants, potamogetons (especially *P. natans*), water milfoil, quillwort, rushes and sedges were found.

As a habitat for game fish, Deer Pond is not to be considered of great importance. The pond is so shallow that temperatures too high for trout prevail during the summer months. Trout have not been found in Deer Pond, at least in recent years, although it is quite possible that a few brook trout may occur there during the colder

months. The introduced yellow perch seems to reign supreme as it is very common and attains a large size, evidently at the expense of the other fish inhabitants. A female perch having a total length of fourteen inches was taken in a gill net while several smaller ones were taken through the ice on hook and line for study by Mr. Oja. Most of the adult perch taken in the winter had been feeding on young perch and common sunfish, the former predominating. The smaller perch in turn had been feeding mainly on cyprinids, although considerable invertebrate life was found in their stomachs.

Common sunfish, red-bellied sunfish, common bullheads, common suckers, horned dace, common shiners and golden shiners were also found in this pond. However, the sunfish, bullheads and suckers do not attain a size comparable to those in waters outside the Adirondacks. Adult suckers were frequently caught in the gill net and their young were found abundantly associated with various cyprinids in shallow water, especially in the small weedy bays and the beaver pond at the inlet.

Wolf Pond. Wolf Pond extends in a north-south direction at the east-central part of the tract. It is approximately one mile in length and averages nearly one-quarter of a mile in width. Catlin Mountain overshadows the pond on its west side, while Moose Mountain extends to the shore on the east. With the exception of small areas at either end of the pond, the shores were mostly high and rocky. Large bowlders jutted out of the water at the various points, sometimes occurring as far as fifty feet or more from shore. Firm gravel deposits, or a combination of yellow sand and gravel occurred about the shore almost everywhere. The northeast and southeast corners of the pond were characterized by having considerable deposits of silt and organic matter.

The immediate shore was bordered with a narrow fringe of standing dead cedars while many fallen trunks and branches were lying in the shallow water at the edge of the pond. A more or less mature stand of hardwoods occurred back of the fringe of cedars. The trees at the shore line were killed a number of years ago when the water level was raised by a beaver dam placed at the outlet.

During the early part of June, 1934, I found only two small inlet streams, one at the north end and the other at the south end. While the latter was of spring origin, scarcely one-quarter of a mile of its extent contained sufficient water to harbor fish. There was a dry stream bed extending to the pond from both Catlin and Moose moun-

tains, which indicated that temporary inlet streams exist during seasons of heavy precipitation. Wolf Creek conducts the water of Wolf Pond to Deer Creek and thence into Catlin Lake.

The pond has a maximum depth of 36 feet, but this depth is not of very great extent. Soundings revealed that a small area in the northern half and another in the southern half was of this depth. The maximum depth for the middle section at the narrows was 23 feet. In general the northern half maintained a greater area of deep water than did the southern half. For example, a depth of 24 feet was recorded for the northern part to within 200 feet of the shore, while at the opposite end the depth at an equal distance from shore was about 15 feet.

There are two kinds of common suckers in Wolf Pond. During early June many dwarf suckers (*Catostomus commersonnii utawana*) ranging from about 5 to 8 inches in length were spawning in the two principal inlet streams only a short distance from the pond. Larger suckers (*Catostomus commersonnii commersonnii*), ranging from 12 to 18 inches in length, were taken during this same period at various places in the pond itself. Examination of these larger suckers revealed that they were spent fish and the condition of their gonads indicated that spawning must have been completed several weeks previously. The dwarf suckers in the north inlet were nearly through spawning at the time of my last visit on June 9th; the peak was really reached on the 5th. The south inlet was eight degrees colder than the north and this difference in temperature between the two streams produced a corresponding difference in the spawning season of the small suckers; those in the colder stream were still present in great numbers a few days after those breeding in the warmer brook had returned to the pond.

Young suckers two to three inches in length were found scattered at various points in shallow water.

The red-bellied sunfish is very abundant in Wolf Pond. Several were caught on hook and line with various baits in rapid succession at the north end of the pond on August 11, 1934. Many others were seen in shallow water. During early June, 1934, many were seen guarding their nests at both the north and south ends of the pond; furthermore, a number fed regularly on the garbage from our camp at the southern end of the pond. The common sunfish evidently does not inhabit this pond.

On June 5, 1934, a small brook trout was taken under a corduroy bridge over the south inlet not far from the pond. Trout also were

found in Wolf Creek but at a considerable distance from the pond. They undoubtedly inhabit the deeper water of the pond although I did not find any there. The north inlet and Wolf Creek really become too warm to be attractive to brook trout while the south inlet is so small that only a few small trout can find suitable habitat there.

Lake trout have been reported from Wolf Pond but not in recent years. An inscription written many years ago on the inside wall of a lean-to near the west shore stated that a hunting party had feasted on lake trout taken from Wolf Pond in late October. It is quite possible that this species still occurs in the pond.

Quantities of common shiners (*Notropis cornutus*) were found at various places in the pond during the first week of June, 1934, particularly near the outlet where large schools of yearlings were noted in shallow water. Adults were at the peak of their spawning activities on June 5th and great numbers of them were found on this date amid the large boulders of Wolf Creek which are located a few rods from the pond. Some of the brilliantly colored males collected here were about six inches in length. By June 9th practically all of these breeding fish had returned to the pond. A few gravid females were taken on the baited sandy area near our headquarters at the southern end of the pond, suggesting the possibility that a certain amount of spawning occurs in the pond itself.

Horned dace were quite generally distributed about the pond, and no large schools were encountered anywhere. Several were caught on hook and line, at the northern end on August 11, 1933. Others, including a few gravid females, were caught in the small minnow seine in shallow water along the shore particularly on the baited ground in early June, 1934. In addition to the above a few large males with pearl organs were found at the mouths of the two inlets. One of these, measuring about ten inches in length, was seen heading for the pond at the north inlet.

Thirty-seven red-bellied dace (*Chrosomus erythrogaster*) were caught in the small minnow seine near our boat-landing at the southern end of the pond. Some of these were attracted by the bait that was placed for them, but a few were taken before the bait was used. This minnow was neither seen or taken elsewhere in the pond, but it is undoubtedly fairly common. A few of the specimens in my collection of June 7th were gravid females. Red-bellied dace provide excellent food for trout and other predators.

The northern sculpin (*Cottus cognatus*) appears to be very rare. None was taken in the pond proper, but two were caught in the

dwarf sucker spawning area of the north inlet and another specimen was taken from a similar area of the south inlet. It may be mentioned that the body cavity of the last named individual was well filled with a parasite that Dr. J. F. Mueller identified as being a *Schistocephalus*.

A few cut-lips (*Exoglossum maxillingua*) were caught with a minnow seine on the baited ground in the shallow water near our camp. This minnow, however, normally prefers water that is too deep for seining, hence it is not surprising that more were not taken. The species is undoubtedly fairly common in the pond and thus has great possibilities as food for game fish.

Although the black-nosed dace is essentially a stream-inhabiting fish, occasionally a few will enter lakes and ponds. In Wolf Pond the only specimens collected were at the outlet and in the immediate vicinity of the two inlet brooks. Several large schools were noted in the outlet only a few yards from the pond.

Fortunately exotic species such as yellow perch, bass and pickerel have not been introduced into Wolf Pond—at least, there is no evidence of their occurrence. It is quite likely that this pond was so isolated that the introduction of any of the above species was not feasible, or perhaps the native game species were present in sufficient numbers to satisfy the few anglers that might go there.

Rich Lake. About nine-tenths of the total area of 364 acres of Rich Lake are within the boundaries of the tract: the balance (western end) belongs to the Arbutus Preserve. The lake lies at an elevation of 1564 feet; its long axis extends in an east-west direction.

Rich Lake and Catlin Lake are the two important drainage basins of the tract. While Rich Lake drains practically the entire lower half of the tract, it receives, in addition, the water of Catlin Lake, which, as has been stated elsewhere in this report, drains the entire northern half. All of these waters pass through Lake Belden before leaving the property.

There is a large wooded island near the outlet of the lake but at certain dry seasons this may in reality become a peninsula. The channel known as "Pickerel Channel" which separates this island from the mainland, is so narrow that one can usually jump across without much difficulty. This island has considerable importance in so far as fish are concerned because important habitats and spawning areas exist along its shore.

Graveyard Bay and Maderia Bay in particular, but most of the other bays as well, have firm bottoms of clean yellow sand. However, rocky ledges and jagged boulders extend into the lake at the steep shore-line areas and such places as Chase Point and Tyra Point. In certain places there are nearly perpendicular walls of solid rock to a height of 25 or more feet at the water front, so that in times of high water one is compelled to make detours via high elevations when wading at the shore line.

The deepest part of the lake occurs at the mouth of Graveyard Bay about due north of Chase Point. The maximum depth recorded here was 57 feet, on August 22, 1934. There is really a very small area that maintains this depth—probably less than an acre. The following depths were recorded at approximately 50-foot intervals measured along a course extending from Chase Point in a northerly direction to Rock Point at the western end of the big island (or peninsula, depending on water level): 21, 36, 50, 54, 56, 56, 57, 57, 54, 45, 40, 30, 30. A depth of 33 feet was recorded at a point in about the mid-region of Graveyard Bay.

The outlet maintains a maximum depth of 12 to 15 feet in the upper section. Points below the Pickerel Channel are much shallower.

The vegetation of Rich Lake was quite similar to that of the other lakes and ponds just described. However, the eastern part of Rich Lake contained several good-sized beds of white water lilies in addition to the more common spatter dock. Many of the white lilies were in bloom on August 6th, particularly in Pickerel Channel Bay (Fig. 307). Sedges grew abundantly along the shore in River Bay, Sonia Bay and about the mouth of Big Sucker and Little Sucker brooks.

Rich Lake and the adjacent Belden Lake are the only waters on the property that are open to the public for fishing. While the nearby residents do a certain amount of fishing in Rich Lake, I believe that over 50 percent of the fishermen are non-residents. Some of the non-resident fishermen are vacationists and, as a rule, do not pursue the sport in a serious way. However, many of them come from such distant communities as Glens Falls, Albany and Schenectady, with the sole purpose of taking home a good catch of fish at the end of the day. These non-residents are attracted by the introduced, but well established, great northern pike. Oftentimes big catches are made, and the sportsmen are well rewarded for their efforts. A party of two men from Albany took 12 on August 22, 1934. Graveyard Bay and the region about the island near the

outlet were the favorite fishing grounds. The beds of water lilies and other aquatic plants so abundant in these places, provide good habitat for the pike, while forage fish are present in sufficient numbers to maintain an ample food supply for them.

Mather (1890, p. 133) believes that the pike was probably introduced into the waters of this part of the Adirondacks about 1860-1865 from Lake Champlain, because of its firm white flesh and excellent flavor. However, the introduction seems to have created considerable disfavor, for Northrup ('03, p. 282) in writing on the game fish of the Adirondacks, makes this statement: "There is no excuse for the pickerel (great northern pike) in the Adirondacks. His introduction there was fiendish and his work among the gentle trout is devilish."

The common yellow perch is another introduced fish that has become well established in Rich Lake. However, as a game fish it has very little significance in this lake, because anglers do not seek it extensively. I suspect the natives prefer to catch brook trout and the larger game fishes such as the pike, although considerable interest is shown in the lowly bullhead during the early part of the summer, when it may be taken after dark. Naturally, visiting anglers would not come from distant points to Rich Lake for the purpose of getting perch when plenty of them are to be had in more accessible waters. Perch undoubtedly has a greater value as forage fish in Rich Lake than as a food fish.

The common bullhead, though considerably stunted in size, occurs in goodly numbers and, as mentioned above, is taken by local residents at night. They are easily prepared for the table and have an agreeable flavor when taken from cold water.

Brook trout were not found in Rich Lake, but I strongly suspect that they inhabit some of the deeper parts. A lake that is said to contain an area of 96 acres over 40 feet in depth would be expected to harbor trout, especially since certain of its tributaries are trout nursery waters. During the summer of 1933 many of the trout in Big Sucker and Little Sucker brooks disappeared with the advent of dry weather. It is presumed that some of them, at least, descended to the lake.

The lake trout may be considered of rare occurrence in Rich Lake. While I have only one record, a fifteen-inch specimen taken in about 45 feet of water, during the summer of 1934, some of the native inhabitants informed me that it has been taken from this lake in former years, particularly in the early spring. Odell ('33, p. 128)

and Greeley ('33, p. 93) do not report the lake trout for Rich Lake. A two-inch gill net set off Chase Point at a maximum depth of 57 feet failed to produce any trout or other fish. There is a thick layer of slimy ooze on the bottom of the lake at this point.

While fishermen frequently drag troll lines over the area where I secured my specimen, lake trout have never been known to be taken in that manner. I suspect, however, that the results would be different, at least in certain seasons, if the troll lines were run nearer the bottom. As stated elsewhere in this report, most of the fishing in Rich Lake is for pike, and the lines, therefore, are not heavily weighted.

The common and red-bellied sunfish are frequently caught on worm-baited hooks, but anglers as a rule do not save them for food purposes. They are really too small and difficult to prepare for the table to be attractive.

Fishing in Rich Lake is very limited during the Summer because there are only a few boats available for that purpose. Usually not over two boats may be seen in use at any one time and the lake is, therefore, not over-fished.

THE STREAMS OF THE FOREST

Panther Brook. This small eastern tributary of Catlin Lake, scarcely a mile in length, has its source on the western slope of Catlin Mountain, but it descends through the valley lying between Catlin and Panther mountains. The stream bed averages about eight feet in width, while the depth varies from a few inches to three or four feet in the pools, depending on the season.

On August 11, 1933, there was very little water in the brook and this was confined in shallow pools. Many plunge basins and other holes that in normal times would contain deep water were absolutely dry on this date. In many places the rocks in the channel were smooth and free from moss, indicating that the stream is fairly rapid at times.

Observations were begun on Panther Brook at its intersection with the old military road, near the headwaters. There was no water in evidence for several rods downstream and then very small pools appeared, all of which were uninhabited by fish. The bottom here was composed of rocks and boulders with a good mixture of sand and gravel. Deeper deposits of sand and gravel were found in the more level stretches. Many holes (formerly sizable pools) were noted in this part of the brook, the majority of which were

immediately below natural dams, the result of log jams and subsequent backing with gravel, sand, brush, leaves and other débris.

Farther downstream the brook assumed a steeper aspect and the bed was characterized by many large boulders. Sand and gravel deposits occurred only in the pools and in the more level stretches. Most of the pools were inhabited by brook trout (all under legal size), but other fish were not found. Even some of the small pools not over ten inches in diameter and one or two inches in depth contained small trout. One pool was at least two feet deep, but the majority was less than a foot and usually about six inches in depth. Comparatively few pools were found in the more precipitous areas because there was little or no running water to replenish that lost through seepage.

A long stretch of the lower part of the brook was in a flat area. There was considerably more water here and the pools were not only more numerous but noticeably deeper. The bottom was composed of gravel and sand. Deposits of this material, now dry, frequently occurred between pools. Hiding places for trout occurred under shelving banks or, in a few instances, under old logs and stumps. There was no outlet to Catlin Lake, the sand beach here being a foot or more higher than the bed of the brook.

Brook trout were found throughout this entire section but in limited numbers. Horned dace were the only fish found associated with it but even this species was limited to one pool where six specimens were taken. However, some could have been overlooked despite the fact that every pool was examined.

A temperature of 56° to 58° F. was maintained throughout the entire length of the brook despite the small volume of water. The source of water supply was undoubtedly subterranean, but with a good cover of beech, birch, maple and ash in mixture with spruce and balsam, the brook was able to maintain this low temperature.

Panther Brook is primarily a nursery brook for Catlin Lake trout. However, the summers of 1933 and 1934 were so dry that the brook was practically worthless even for this purpose. In years of normal precipitation, it is doubtful if trout of legal size (7 inches in total length) occur there. I believe there was a greater concentration of aquatic invertebrate animals in this stream than normally occurs in most Adirondack brooks of this character.

Big Sucker Brook. This brook was studied on June 3, 5 and 7, in 1933, then again on August 5th. Only certain portions of it



Fig. 313. Scene in upper section of Wolf Creek showing first pool inhabited with brook trout. August 10, 1933.



Fig. 314. Outlet of Round Pond. Typical scene well upstream in burned over area. August 8, 1933.



Fig. 315. Scene in lower portion of Deer Creek. Characterized by larger and deeper pools and fewer boulders than in upper portion of the creek. August 14, 1933.



Fig. 316. Outlet of Deer Creek through sand beach of Catlin Bay at low water stage. August 14, 1933.

were reached in June, but the entire length of approximately $2\frac{1}{4}$ miles was covered on the last visit. The lower half of the brook was re-examined on June 7, 1934.

Although Big Sucker Brook is somewhat wider than Little Sucker Brook and contains a greater diversification of habitats, it is frequented with fewer trout. I feel sure that the brook is not stocked to full carrying capacity.

Like Little Sucker Brook this stream cuts across the southeast corner of the tract and enters Rich Lake slightly more than one-half mile to the north. I believe the headwaters lie just beyond the eastern boundary during normal water levels. However, on August 5th, I found no water beyond the small sphagnum bog located just inside the boundary. A definite channel led from a small shallow soft-bottom pool in this bog, but it soon became lost amid dense growth of raspberry bushes, alders, grass and brush.

More or less swamp-like conditions prevailed along the stream for practically one-half mile. The stream at times became ramified but usually a definite channel of shallow water was visible amid the tangle of vegetation. Despite these seemingly adverse conditions, several brook trout of the advanced fingerling size were noted. However, these appeared to be rather unhealthy even though the water registered 60° F. and seemed to contain plenty of food. The water undoubtedly was excessively acid since it was quite brown and originated in the immediate proximity of the bog.

The next section of approximately one-half mile ending at a beaver meadow was more precipitous, especially in places. At one place in particular there was a drop of 8 to 10 feet in a distance of about one rod. The water here came down the face of huge boulders (or amid them) into deep plunge basins. On my first visit here in June, strange as it may seem, I found trout in pools at various levels in these waterfalls. This phenomenon coupled with the fact that trout occurred above these falls seems to indicate that migration takes place upstream.

The section as a whole was characterized by alternating pools and riffles or boulders (Fig. 305). The trout were rather scarce and occurred mainly in the pools. When disturbed they took refuge amid the boulders. On August 5th, the date on which the above observations were made, the water was generally limited to pools and even these were extremely low. However, the water was cold. Occasionally a trickle of water was found between the pools, but

there was no pronounced current anywhere. The pools in this section certainly could not be considered stocked to full carrying capacity.

Nearly one-half mile of the stream in about its mid-section was in an old beaver meadow (Fig. 309). The beaver dam had been in disuse for several years, but it was still impounding a pool of water ten or twelve feet in width and to a maximum depth of nearly three feet for a space of several rods, even during the dry season of August (Fig. 310).

The stream took a rather tortuous course through the meadow and it was nowhere more than six feet in width. The bottom was composed of sand and silt, the latter along the shore and increasing in depth at the approach to the dam. This stretch of the stream was fairly level, consequently the current was comparatively slow. While the volume of water was not very great even in early June, by August fully two-thirds of the brook in this meadow was absolutely dry.

On August 5th the black-nosed dace, horned dace and pearl minnows that inhabited this section earlier in the year were concentrated in the pond at the dam. There were also a good many in a deep pool at the head of the meadow which on June 3rd was about thirty inches deep and contained several brook trout in addition to the minnows just mentioned. The trout were absent on my August visit and the other fish were about to succumb for the want of water. Strange enough the temperature of the water in this pool was the same (60° F.) as it was in June. Alders and grass provided good shade and the water was very likely supplied by a spring.

It is of interest to note that this beaver meadow portion of Big Sucker Brook was the only section inhabited with pearl minnows (*Margariscus margarita*). As a matter of fact there were more of these minnows in this section than were found throughout the balance of the tract. The black-nosed dace and horned dace, too, were concentrated in this section of the brook.

Immediately below the ruins of the old beaver dam there was an abrupt change in the stream and its forest cover. Here the stream bed very suddenly changed to a mass of bowlders and moss-covered rocks with intervening pools or stretches of sand and gravel riffles. A good forest cover, though not particularly dense, was also provided at this point. This change was sufficient to

transform the warm and nearly stagnant water at the beaver pond from 74° F. to 60° F. within the space of a few rods.

As might be expected, this difference in habitat had a direct bearing on the fish population. The black-nosed and horned dace that were so abundant in the beaver pond and the first few pools of the rocky wooded area immediately below suddenly became greatly diminished in numbers. Concurrent with the disappearance of these minnows was the re-appearance of brook trout. I suspect that springs through subterranean channels fed the brook to accomplish this sudden change in temperature. The trout population of this section was rather sparse and many excellent pools having all the essential requirements of a trout habitat were barren.

After a distance of about one-fourth mile the brook coursed through a fairly level area. The bed here was composed of sand and gravel with riffles alternating with shallow to medium sized pools. An occasional deep pool was formed as the result of log or débris jams, and these were sometimes frequented with brook trout in addition to a few black-nosed and horned dace. One partially decayed log, about two feet in diameter and twenty-five feet long (Fig. 306), lying lengthwise at the margin of the brook, provided hiding places for a number of trout, some very nearly legal size.

The forest was not very dense about this portion of the stream, but patches of tall grass and clumps of alders provided sufficient shade to maintain a temperature of 60° F. Considerable seepage was noted in a number of places and I found one sizable spring feeder producing a considerable amount of cold water. No doubt other springs were overlooked.

The lower section of Big Sucker Brook was fairly precipitous. There was an abundance of huge moss-covered boulders in the stream bed as well as a few outcrops of granite rock. During my visits here in early June the brook was fairly rapid and there were numerous deep pools with bottom of sand and gravel amid the boulders and below the waterfalls. However, brook trout were either scarce or securely hidden. I suspect that some, at least, had taken advantage of the wonderful hiding facilities and were thus overlooked. Other species of fish were absent except in the immediate vicinity of the lake where marsh-like conditions prevailed.

The forest cover of the lower section of Big Sucker Brook has not been disturbed as much in recent years as has the contiguous ter-

ritory. Fortunately, the few conifers bordering the stream here were unmolested during the last lumbering for pulpwood, so that a mixed stand of conifers and hardwoods now prevails.

In general it may be said that Big Sucker Brook is not an ideal habitat for brook trout. In fact, it is undoubtedly much poorer in this respect than it was before the area was cut over a few years ago. The difficulty lies in the lack of a constant supply of water during the summer months. While the proper temperatures are maintained throughout that period, the volume of water is so diminished that the foraging area is very greatly reduced.

There is really adequate cover and food for more trout than actually exist in Big Sucker Brook at the present time. I believe that the volume of water will automatically increase as the second growth timber develops. There is no need for constructing dams or other artificial devices to improve the habitat unless there is some way of maintaining a more constant water supply.

Little Sucker Brook. Studies were made on Little Sucker Brook on June 2nd and 6th and again on August 6th (1933). On the earlier visits following the spring freshets the water level was nearly normal. Very little precipitation occurred thereafter until late in August, consequently the brook was extremely low in volume of water on my last visit.

This small tributary of Rich Lake originates slightly beyond the eastern boundary of the tract. It flows diagonally across the southeast corner to enter the lake near its outlet. Although scarcely one and one-half miles in length, it maintains an average width of about six feet in the normal late spring and early summer seasons. The depth varies from a few inches to a maximum of about three feet, the greater depth, of course, being in the pools.

The stream bed for the most part was composed of bowlders and cobblestones, many of which were covered with a dense mat of moss, algae and lichens. The pools and certain level stretches, in addition to pockets amid the bowlders and sheltered places contained deposits of sand and gravel. These should provide ample spawning facilities.

Huge bowlders were rather common, especially in the lower more precipitous portion of the brook. These may be considered an asset as far as the welfare of the trout is concerned, for not only were they the direct cause for many natural dams and pools, but in addition, frequently provided hiding places. All of these features

are necessary prerequisites for a good trout habitat. On numerous occasions I saw trout dashing from the pools to their hiding places beneath boulders.

An old corduroy road, constructed six or seven years ago, when this section of the tract was lumbered for pulpwood, crosses and recrosses Little Sucker Brook. Trout were able to find shelter under these crude bridges, especially where they were sagging into the brook as was the case in several instances. In some places the poles used in the construction of these corduroys had floated away during high water and had later become lodged amid boulders. Corduroys have thus inadvertently improved the brook as a trout habitat by providing cover as well as nuclei for various types of small dams.

The brook was remarkably free from brush and other rubbish of the character ordinarily found in forests subsequent to lumbering operations. It is probably a better habitat for trout at the present time than it was during the first year or two following the logging. The surviving trees, together with subsequent reproduction, now provide adequate shade for the brook.

On my first visit (June 2, 1933) there were many minnows and sunfish at the mouth of the brook, but brook trout were the only fish inhabitants above that area. Various sizes of trout up to six or six and one-half inches in length (estimated) were noted. The upper waters appeared to be better stocked than the lower, although the average size of those in the latter was somewhat smaller. Nearly every pool contained from three to six or even eight trout—they were evidently stocked to full carrying capacity.

On August 6, 1933, I found the volume of water reduced so that it approached the danger point for trout. As a matter of fact the water, for the most part, was limited to pools. Occasionally there was some indication of a current above ground, but generally the water passed from pool to pool through under-surface channels. Despite its small volume, the water was still fresh and cool (60° F.).

The trout population was noticeably smaller than it was in early June and yet there were several individuals landlocked in most of the existing pools. Moreover these survivals appeared to be in good physical condition despite their limited quarters and other adverse circumstances. I counted fifty-two pools in the lower inhabitable portion of the stream, the majority of which were 12 or more inches deep. These contained an average of about six trout each. Most

of the pools in the upper section were dry or nearly so and, therefore, contained no fish. A notable exception was an isolated pool eight feet in diameter and two feet deep located near the headwaters. Here I found four live and one dead trout, ranging from 4 to 6½ inches in length. Although the water was rather turbid, due to recent wading by deer, it was 60° F. Judging from the well-trodden runways leading to this pool and the numerous tracks about its margin, it appears that several deer visited this pool daily. The death of the trout mentioned above was probably due to the unfavorable condition created by these deer rather than to other factors.

In contrast to the above, I found in the lower section of the brook, a healthy looking three-inch trout inhabiting a pool over gravel bottom that was scarcely a foot in diameter and about two inches in depth. The only place of concealment was the edge of a projecting rock about four inches in diameter. This pool was well-shaded, cool and contained a few aquatic invertebrates. I suspect that it became dry before the rain arrived some two weeks later.

Little Sucker Brook is really too short and contains an insufficient volume of water to provide many trout of legal 7-inch size. Nevertheless, it could serve a very useful purpose as a nursery stream for Rich Lake, should that body of water prove to be a suitable habitat for adult trout.

I have no records of brook trout in Rich Lake and it would appear that conditions there are not particularly favorable for it. As stated elsewhere this lake is abundantly stocked with such introduced predacious species as yellow perch and great northern pike.

Corner Pond Outlet.—This stream, less than a mile in length, is a connecting link between Corner Pond and Catlin Lake. During periods of heavy rainfall it undoubtedly carries a great volume of water which subsides within a few days following a storm so that with the advent of dry periods scarcely any water remains in the upper more precipitous parts.

There are no spring feeders in the upper section of the stream, therefore the volume of water fluctuates with the rise and fall of the level of Corner Pond. Unfortunately the pond has a very limited watershed which is mostly on the steep eastern slope of Kempshall Mountain and as a result there is not a constant supply of water to replace that lost by evaporation or by overflow into the outlet.

The head of the creek is fully twenty-five feet in width and it is clogged with a deposit of cobblestones which average three to four inches in diameter. At the time of my visits there on October 2, 1932 and again during August of the following year the deposit of cobbles was considerably higher than the level of the pond and this precluded the possibility of water reaching the creek except through seepage, which, incidentally, was practically negligible.

The upper quarter of Corner Pond outlet was a very poor habitat for fish at the time of my visits there. In fact, there was only a small amount of water, much of which occurred in shallow pools amid the large moss-covered angular boulders so characteristic of the stream-bed below the first few rods of the stream. No fish were found in the upper pools but a few small horned dace and black-nosed dace began to appear in the larger ones located in the more level stretches where the bottom was quite soft and composed of sand covered with considerable silt. The temperature of the water in this part of the brook was 60° F.

The middle section of the brook was more precipitous than the other parts and much of the 123-foot drop in elevation between Corner Pond and Catlin Lake occurred in this part of the outlet. There were a few rather level stretches interspersed with the steeper parts and the pools of any consequence were located in such areas. An occasional brook trout was found in the larger pools, particularly those provided with cold water and convenient hiding places.

The temperatures throughout this middle section varied considerably, depending largely on the type and amount of forest cover. A difference in temperature of six degrees was noted in two pools which were less than a rod apart. The warmer water was in the pool farthest downstream, but it was exposed to the sun while the other pool was protected by a dense cover of sapling yellow birch. There was no current of water between the pools.

The last one-quarter of a mile or so of Corner Pond outlet was in a low flat area. This was fairly well-shaded with alders beyond which occurred a dense stand of sapling yellow birch with a mixture of other species of deciduous trees. The alders occupied a wider zone and were denser in the immediate vicinity of Catlin Lake than farther upstream. This made the brook rather difficult to approach and the situation was further complicated by the presence of a beaver dam at this point which not only inundated the marginal areas but rendered them soft and miry.

The brook gradually acquired a greater volume of water as it neared Catlin Lake until a maximum of about three feet was recorded in the impounded waters back of the beaver dam. There was a deep isolated pool of water beyond the dam but a high sand bar at the shore of Catlin Lake precluded the possibility of an outlet into that body of water at its low level.

The stream bed in this lower section was composed mostly of sand and detritus. Logs, sticks and brush with an occasional bowlder were contributory factors in the formation of pools. There was a great accumulation of partially decayed leaves on the bottom of the stream in the vicinity of the beaver dam from which a considerable amount of ill-smelling gas emanated while I was seining for fish.

An occasional brook trout was found in this part of the stream although the largest measured only $4\frac{3}{4}$ inches in total length. There were, in addition, a few species of fish that did not occur in the upper waters of the brook. The following were found for the first time inhabiting a comparatively large pool about 18 inches in depth: red-bellied dace (*Chrosomus erythrogaster*), cut-lips minnow (*Exoglossum maxillingua*) and pearl minnow (*Margariscus margarita*). A stray yellow perch was captured at another point while large numbers of small common suckers and golden shiners were found in the beaver pond.

Caddis-fly larvae, stonefly nymphs and crayfish occurred among the rocks and bowlders in the upper water of Corner Pond outlet, but dragonfly nymphs were the conspicuous invertebrates occurring in the detritus at the lower levels. In general the invertebrate life, available as food, was adequate to meet the needs of the existing fish population.

Corner Pond outlet is altogether too short and inadequately supplied with water to have much importance as a trout habitat. However, during summers of normal precipitation it could function as a trout nursery brook for Catlin Lake and perhaps to a very limited extent for Corner Pond. In all probability it will never support trout of legal size. Its use as a spawning area for trout other than those in residence is also questionable because of the physical barriers mentioned above.

Undoubtedly some of the species of cyprinids and suckers that breed early in the spring would find it possible to enter Corner Pond outlet either from Corner Pond or Catlin Lake or both and



Fig. 317. Beaver pond on inlet of Deer Pond. Aug. 11, 1933.



Fig. 318. Beaver meadow and dead cedars at the head of Wolf Pond. The south inlet of the pond is located near this site. June 4, 1934.

thus avail themselves of any spawning areas that might be suitable to their peculiar needs. The large number of small suckers and golden shiners congregated in the beaver pond is rather indicative of such activities.

Wolf Creek. The outlet of Wolf Pond, known as Wolf Creek, flows in a northwest direction for about three-quarters of a mile and then almost due west for nearly a mile to join Deer Creek, which in turn empties into Catlin Lake. The creek starts at an elevation of 1860 feet above sea level, but drops about 160 feet before reaching Deer Creek. The greatest drop in elevation occurs in the first half-mile, a total drop of approximately one hundred feet.

The head of Wolf Creek is rather wide (Fig. 303) and the pools, which are fairly shallow with a deep deposit of silt, vary from medium to large size. Huge boulders occur about these pools and when close together, as frequently happens, they provide convenient cover for fish, particularly at spawning time. In early June, 1934, many spawning common shiners availed themselves of this protection. Some of the bordering cedars, killed as a result of the beaver flooding, have fallen in the creek and in certain specific instances have caused quite an obstruction.

Below the area affected by the beaver flow, the creek bed was a mass of moss-covered rocks and boulders with sand and gravel occurring only in small pockets (Fig. 304). At the time of my visit there in August, 1933, scarcely any water could be found except in pools—just a mere trickle deep among the rocks. In June of the following year there was slightly more water in the creek although insufficient in amount to provide suitable habitat for trout.

There were a few pools in this part of the creek, but they contained only a small volume of water. However, I was quite surprised to find that the water was very cold, a temperature of 56° F. being recorded on August 10th at 2:30 P.M. The stream is well sheltered with trees throughout this section and the boulders aid materially, as well, in the maintenance of this low temperature.

An occasional small brook trout and a few horned and black-nosed dace were the only fish found in this part of the stream.

A series of three small beaver meadows only a few rods apart followed the section described above and then there occurred a large beaver meadow nearly a half-mile long that was inhabited with a thriving colony of beaver. A few beautiful pools occurred in the

smaller meadows and the largest brook trout observed throughout the entire stream were found here. At least four trout of legal size were living in one pool alone (Fig. 302).

The stream bed between the meadows was similar to that farther upstream, i.e., moss-covered boulders with deposits of sand and gravel in the interstices and with only a trickle of water in evidence.

The large occupied beaver meadow contained two or more channels of deep quiet water, but those outside the main channel appeared to be beaver canals filled with dark brown and ill-smelling water. The channels terminated in a large beaver pond which was formed as a result of a long but low beaver dam.

It was quite impossible to collect in this part of the creek and in the pond because the water was deep and the bottom very soft, but I captured a few horned dace and red-bellied dace in the more accessible parts. Some fish are probably resident here but I believe many others descend from the upper waters during such drought periods as occurred in the summers of 1933 and 1934 to augment the numbers already present. One might even expect brook trout to occur here. The temperature of the water at the beaver dam was 70° F., but the temperature of the water at the head of the beaver pond and in the adjacent creek channel was considerably lower and therefore quite desirable for brook trout. A few scattered alders at the head of the pond represented the only forest cover. However, a dense, rank growth of cut-grass occurred throughout this area and provided a certain amount of cover, particularly along the creek channel.

From the beaver dam to Deer Creek, a distance of slightly more than one-quarter of a mile, varied conditions prevailed. Immediately below the dam the stream was very shallow, narrow and rocky—a decidedly poor habitat for fish. Then occurred a sizable stretch characterized by sand and gravel bottom and surrounded by a wide, dense patch of alders. Another beaver colony had become established at the extreme lower end of this creek and the dam had affected the water level for a considerable distance upstream. In this particular instance I believe the beaver dam was a distinct advantage to the fish because the pools which would ordinarily be extremely low in volume of water were now filled to the proper level.

This part of the creek was well sheltered with large trees and underbrush, consequently temperatures sufficiently low to be favor-

able for brook trout prevailed. Although brook trout were neither seen nor collected here, conditions were such that they could have easily escaped detection.

A few black-nosed dace were found here, but immature horned dace were abundant, particularly in the deep water adjacent to the beaver dam.

Inlets of Wolf Creek. The U. S. topographic map shows four inlet streams for Wolf Pond but only two of them are worth considering in this report because the others are intermittent and seldom if ever support fish. The largest inlet enters the north end of the pond and for sake of convenience is called "North Inlet." The other inlet enters at the south end and is known as "South Inlet."

North Inlet has its source in the Moose Pond area, a considerable distance beyond the boundary of the tract, and it parallels the Cold River road, entering the pond only a few rods north of the outlet. This stream was practically dry at the time of my visit there in August, 1933. However, in early June of the following year the stream had a moderate current and many of its pools contained 5 to 8 inches of water—some, considerably more.

The lower part of the brook, approximately one-eighth of a mile in extent, meandered through an old beaver meadow and contained sand and gravel bottom, mostly the former. Raspberry bushes, ferns and cut-grass grew along the banks while large but usually dead trees towered above it. Many old sticks and logs mingled with leaves and other débris occurred in the stream and frequently helped to form pools.

Two sculpins and a few horned dace and black-nosed dace in addition to spawning suckers were the only fish inhabitants.

This part of the stream was being utilized rather extensively by dwarf suckers for spawning purposes during the week of June 5, 1934. Apparently this fish is unable to negotiate waterfalls which have a sheer drop of approximately one foot, consequently its progress upstream is determined solely by the topography.

The high upper section of this inlet was very rocky and contained numerous log jams and fallen trees. That particular part of the stream appeared to be uninhabited with fish and yet there was sufficient water in the riffles as well as the pools to be attractive for them. The water was fairly cold and did not exceed 62° F. anywhere.

South Inlet was much smaller than North Inlet. In fact it was just a mere rivulet beyond the first quarter of a mile and in certain places it was rather difficult to find any stream at all. Its source is on the southwestern slope of Moose Mountain, but small springs supplement the water supply at various points along its course.

This is not a very important stream because it is small and, in all probability becomes dry during drought periods. The last ten rods or so, however, attract a few spawning fish, particularly dwarf suckers, in the spring and early summer. Here the stream flows through a low flat area (Fig. 318), but has a firm sandy bottom. A considerable amount of brush, sticks and logs and sometimes uprooted dead cedars occur along the brook and provide cover and hiding places for fish. Quite frequently suckers were found spawning underneath or at the edge of a floating log or other object.

Only one small brook trout ($3\frac{1}{2}$ inches long) was found in the creek and this was in a pool under an old corduroy bridge. A few horned dace and one sculpin were also found in the same pool. Exclusive of the spawning suckers these were the only species of fish inhabiting the brook.

On June 9, 1934, the temperature of this inlet was 59° F. or ten degrees colder than the pond and eight degrees colder than North Inlet. Toe spawning activities of the suckers lasted several days longer in this brook than in the warmer waters of North Inlet.

Deer Creek. The outlet of Deer Pond, known as Deer Creek, flows in a southwesterly direction and empties into Catlin Lake, approximately three-quarters of a mile distant. Wolf Creek joins this stream about one-fifth of a mile below Deer Pond and thus augments the volume of water considerably. However, the combined waters of the two streams are insufficient in drought periods to maintain a steady current of water between pools. On the other hand the watershed is of sufficient magnitude to cause a considerable increase in the volume of water delivered to the creek following even moderate rainstorms. Torrential conditions occur for a relatively short period only in case of heavy showers.

The upper part of the creek was bordered by alders in addition to overhanging ferns, low shrubs and herbaceous plants of various sorts typical of semi-bog areas. While the bottom had a sand base there was sufficient silt and muck in the upper layers to bring about a soft miry condition, particularly in the pools.

The stream varied in width from three to six feet, possibly a little more at the pools. The depth was about eighteen inches at first, but gradually decreased within the next thirty or forty rods until there was not over six or eight inches except in certain pools. A beaver dam located near the confluence of Deer Creek with Wolf Creek had inundated a small area along the creek and in addition had increased the depth in the channel to a maximum of three feet. However, Wolf Creek was affected more than Deer Creek as a result of the beaver dam.

The stream bed of Deer Creek was fully twenty-five feet in width beyond the Wolf Creek junction and was composed of a mass of smooth clean rocks and boulders (Fig. 301). The small volume of water was so distributed throughout this wide stream bed that generally only a trickle could be seen amid the rocks. However, the water accumulated in pools at various areas that were free of rocks and boulders. Such places not infrequently were found adjacent to large boulders or below small waterfalls.

Toward the lower end of the creek the rocks and boulders gradually became scarcer and the channel narrower which resulted in the formation of a definite channel. A series of relatively large pools alternated with patches of boulders throughout this part of the creek. However, before entering Catlin Lake the creek meandered through a low grassy area surrounded by alders and attained a maximum depth of approximately three feet. There was a very narrow and shallow channel extending through the sandy beach of Catlin Bay (Fig. 316).

The temperature of the water in Deer Creek near the pond was 78° F. on August 9th. However, a decided drop in temperature occurred as soon as the stream acquired a forest cover and received water from adjoining springs. A temperature of 66° F. was recorded slightly above Wolf Creek junction while the temperature of the combined waters was only 62° F. A minimum temperature of 60° F. was recorded at points farther downstream on August 14th.

Of the various species of fish inhabiting Deer Creek the horned dace was by far the most abundant and most generally distributed. Many specimens one and one-half to two inches in length were found in association with black-nosed dace, small suckers and small red-bellied sunfish in the vicinity of the pond. From this point to the Wolf Creek junction relatively few were found until the deep pool back of the beaver dam was reached where thousands of small

dace were encountered. Very few specimens were found below the dam until the water became deeper at the approach to Catlin Lake. Large specimens were found here during August, 1933, and again on June 6, 1934. Those taken on the latter date were spawning fish.

Black-nosed dace were fairly common at Deer Pond but only scattered individuals or small groups were found thereafter except near Catlin Lake where a definite increase in numbers was apparent.

A few fingerling suckers were found near Deer Pond during August, 1933, and the adult dwarf form was taken on its spawning beds near Catlin Lake on June 6, 1934. Since it is difficult if not impossible to distinguish the young of the two subspecies of the common sucker there was some uncertainty regarding the identity of those found in this creek but I suspect they belong to the typical common form (*Catostomus commersonnii commersonnii*).

In addition to the spawning dwarf suckers, mentioned above, I found common shiners, cut-lips and long-nosed dace on the spawning area at the lower part of Deer Creek on June 6, 1934. The shiners were numerous, very large and brilliantly colored but the other species were represented by moderate numbers. These species were not found during the low water stages that existed throughout August, 1933.

No brook trout were found in Deer Creek although there is a strong possibility that some may have been present in the deeper and more inaccessible pools, such as occur in the flooded area at the beaver dam and at the mouth of the creek. Then, too, the species might possibly migrate from Wolf Creek or Catlin Lake to this creek when more favorable conditions prevail in late autumn or early spring. Certainly Deer Creek is just as capable of supporting trout as are some of the other streams on the tract.

Little Deer Creek. The inlet of Deer Pond has its source fully one-half mile beyond the eastern boundary of the tract at an elevation of approximately 1900 feet, or 234 feet above the pond itself. The upper part of the creek is very steep and is undoubtedly dry or nearly so, during periods of scanty rainfall. The portion within the boundaries of the tract which is nearly a mile in length is fairly level and contains sufficient water to support fish, even during excessively dry periods.

When I visited this creek in August, 1933, I found that there were two rather large beaver dams. The upper dam was constructed a number of years ago and while it has long since been abandoned

by the beaver the pond of impounded water still exists and for convenience sake is herewith known as "Little Deer Pond." This pond was about one-quarter of a mile long and several rods in width. The lower dam, located near the mouth of the creek, was still under construction at the time of my visit there although a considerable area had been inundated.

Little Deer Pond is quite similar to the usual type of beaver pond since it contains many dead trees or their stubs. It differs from some ponds in that it contains a few small grassy islands. These islands provide excellent retreats for such waterfowl as black ducks and mergansers, particularly the former.

Many minnows such as horned dace and black-nosed dace were seen in this pond and there were undoubtedly other species beyond the reach of my net in the deeper parts. Brook trout would not be expected to occur here because the water becomes too warm and in other respects quite unsuited to their welfare.

A small volume of water was escaping through the beaver dam but there was none flowing over the top.

The bed of Little Deer Creek was five to six feet in width near Little Deer Pond, but at the time of my visit the water was confined to a very narrow rocky channel. However, a good many shallow pools occurred throughout this part of the creek and the fish inhabitants were concentrated there.

The pools were mostly of the soft silty bottom type over a substratum of rock and bordered by typical Adirondack beaver meadow vegetation. This vegetation even extends into the shallower parts of some pools and greatly improves the habitat for the minnows contained therein.

The lower beaver dam, as stated above, was new. While a considerable area of woods which was adjacent to Little Deer Creek had been flooded (Fig. 317) the trees and undergrowth were still alive. Many little channels and ponds occurred amid the hummocks, rocks, depressions, etc. These contained an abundance of sucker fingerlings, particularly, but with small horned dace, red-bellied dace and pearl minnows associated with them. One rather large fish (probably a sucker) was observed near the extreme eastern end of the beaver dam.

The entire valley adjacent to Little Deer Creek was burned over in 1903 and subsequently it has grown up with aspen, brake ferns and other vegetation typical of Adirondack burned areas. The

vegetation in the immediate vicinity of the stream has been further modified as the result of periodic beaver activities. Remnants of old beaver dams and their cuttings occurred throughout the section below Little Deer Pond and at several places the creek was literally jammed with the cuttings.

Little Deer Creek has a number of spring feeders along its course which has a very appreciable effect on the water temperature. For example Little Deer Pond registered 70° F. while the creek, a few rods below, was only 68° F. From here to Deer Pond the temperature fluctuated from 68° F. to 72° F., depending on the proximity to the nearest upstream spring feeder.

This creek is unsuitable as a habitat for brook trout in its present condition largely because of its inability to maintain a proper volume of water within the requisite temperature range. The forest cover has not been adequately restored subsequent to the 1903 fire that devastated a large part of Little Deer Creek watershed. However, conditions are improving annually and I believe that eventually the habitat will attain the desired quality necessary to warrant the reestablishment of brook trout.

Many of the small suckers and minnows undoubtedly descend to Deer Pond at the approach of winter and eventually fall prey to bullheads and to the introduced yellow perch.

LIST OF FISHES KNOWN TO OCCUR IN THE WATERS OF THE HUNTINGTON FOREST

1.	Lake trout	<i>Cristivomer namaycush</i>
2.	Brook trout	<i>Salvelinus fontinalis</i>
3.	Common sucker	<i>Catostomus commersonnii commersonnii</i>
4.	Dwarf common sucker	<i>Catostomus commersonnii utahana</i>
5.	Long-nosed dace	<i>Rhinichthys cataractae</i>
6.	Black-nosed dace	<i>Rhinichthys atronaso</i>
7.	Horned dace	<i>Semotilus atromaculatus</i>
8.	Pearl minnow	<i>Margariscus margarita</i>
9.	Red-bellied dace	<i>Chrosomus erythrogaster</i>
10.	Black-nosed minnow	<i>Notropis heterolepis</i>
11.	Common shiner	<i>Notropis cornutus</i>
12.	Golden shiner	<i>Notemigonus crysoleucas</i>
13.	Cut-lips minnow	<i>Exoglossum maxillingua</i>
14.	Common bullhead	<i>Ambloplites nebulosus</i>
15.	Great northern pike	<i>Esox lucius</i>
16.	Yellow perch	<i>Perca flavescens</i>
17.	Common sunfish	<i>Lepomis gibbosus</i>
18.	Red-bellied sunfish	<i>Lepomis auritus</i>
19.	Rock bass	<i>Ambloplites rupestris</i>
20.	Northern sculpin	<i>Cottus cognatus</i>
21.	Large mouth black bass	<i>Aplites salmoides</i>

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The State of New York is the trustee of this wild life Memorial to Theodore Roosevelt. The New York State College of Forestry at Syracuse is a State institution supported solely by State funds and the Roosevelt Wild Life Forest Experiment Station is a part of this institution. The Trustees are State officials. A legislative mandate instructed them as follows:

"To establish and conduct an experimental station to be known as 'Roosevelt Wild Life Forest Experiment Station,' in which there shall be maintained records of the results of the experiments and investigations made and research work accomplished; also a library of works, publications, papers and data having to do with wild life, together with means for practical illustration and demonstration, which library shall at all reasonable hours be open to the public." [Laws of New York, chapter 536. Became a law May 10, 1919.]

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By these laws the Empire State has made provision to conduct forest wild life research upon a comprehensive basis, and on a plan as broad as that approved by Theodore Roosevelt himself.

SKETCH MAP
ARCHER AND ANNA HUNTINGTON
WILD LIFE FOREST STATION

.. 1936 ..





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